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AUTHOR Bussey, Margery Koo

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ABSTRACT

Finding ways of influencing rules and the decision-making process in school is the challenge of this Unified Sciences and Mathematics for Elementary Schools (USMES) unit. The challenge is general enough to apply to many problem-solving situations in mathematics, science, social science, and language arts at any elementary school level (grades 1-8). The Teacher Resource Book for the unit is divided into five sections. Section I describes the USMES approach to student-initiated investigations of real problems, including a discussion of the nature of USMES "challenges." Section II provides an overview of possible student activities with comments on prerequisite skills, instructional strategies, suggestions when using the unit with primary grades, a flow chart illustrating how investigations evolve from students' discussions of the problems, and a hypothetical account of sixth-grade class activities. Section III provides documented events of actual class activities from grades 3 and 8. Section IV includes lists of "How To" cards and background papers, bibliography of non-USMES materials, and a glossary. Section V consists of charts identifying skills, concepts, processes, and areas of study learned as students become involved with the activities. (JN)

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School Rules

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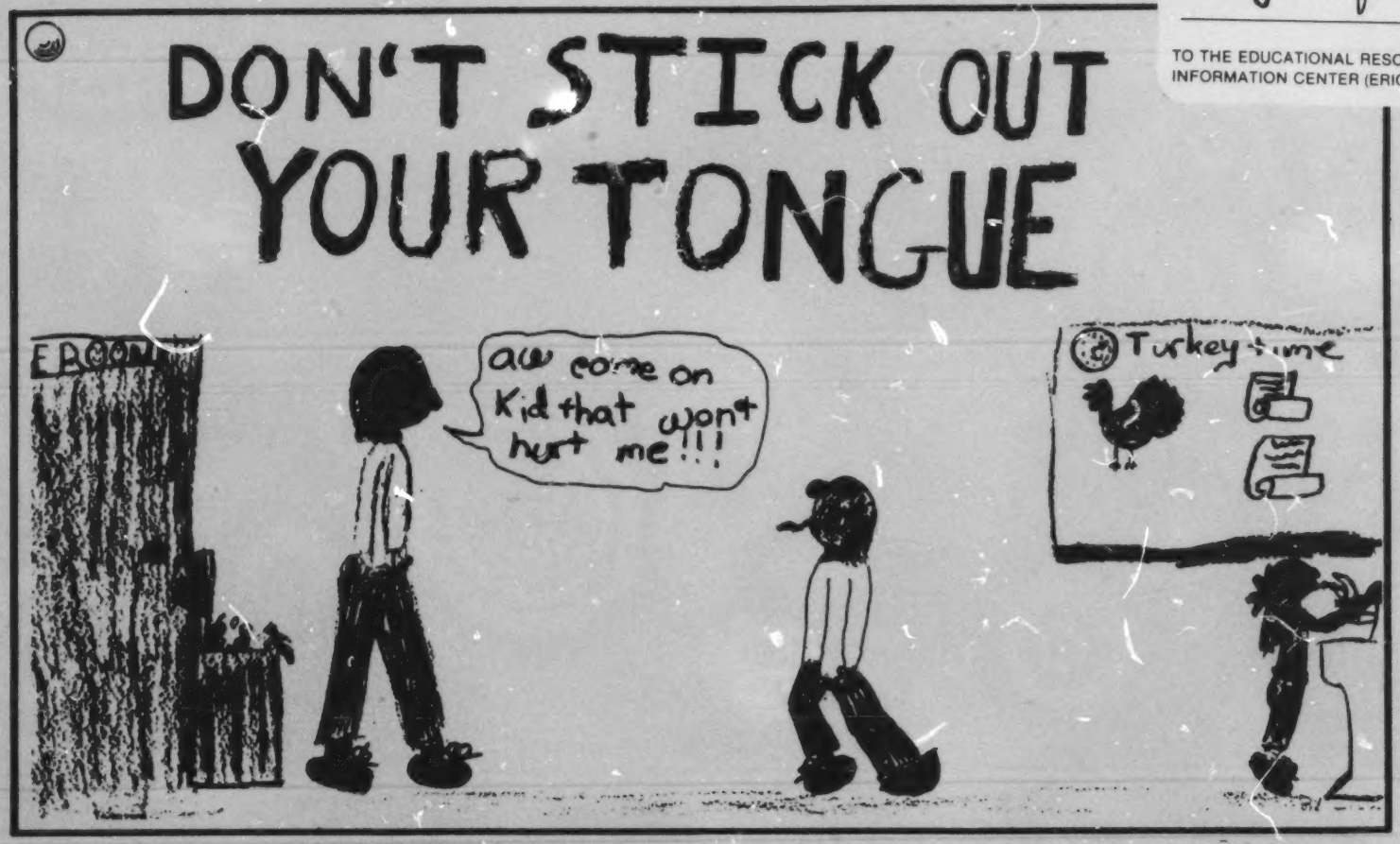

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Contributors

This Edition of School Rules:

Written and edited by Margery Koo Bussey
Supervising editors: Betty M. Beck, L. Ray Brady, Jr.
Production work: Margery Koo Bussey, L. Ray Brady, Jr., Martha Allegro
Production assistants: Paula Santillo, Peter Zevitas, Nancy C. Brady
Cover and title page: John W. Saalfield

University Content and Curriculum Specialist

Janet Alleman-Brooks, Michigan State University

Classroom Teachers

Betty Bailey, Lansing, MI
Margaret McD. Cox, New York, NY
Daniel Gates, Howell, MI
Barbara Klosinski, Burnsville, MN
Lucy Knappen, Lansing, MI
Marybeth McGrail, Watertown, MA
Kathryn McNenly, Lansing, MI
Kathleen Schultz, Boulder, CO
Natalie Thayer, Sanford, ME
Mary Ellen Warner, Charleston, SC
Mary Yates, Lansing, MI

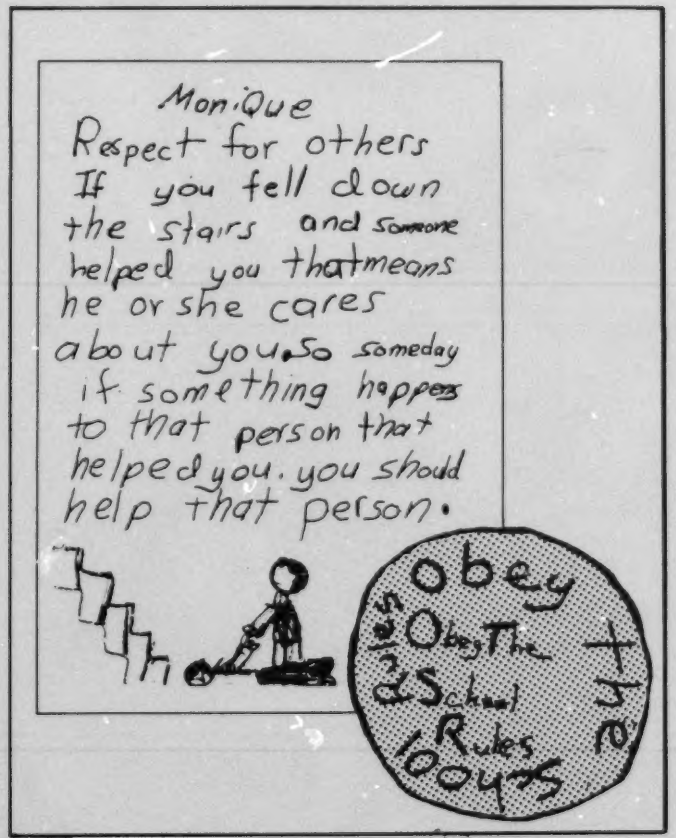
We are deeply indebted to the many elementary school children whose investigations of the challenge form the basis for this book; without their efforts this book would have not been possible. Many thanks to the Planning Committee for their years of service and advice. Special thanks go to other members of the USMES staff, especially to Charles Donahoe for coordinating Design Lab activities, to Lois Finstein for organizing development workshops, and to Christopher Hale for his efforts as Project Manager during classroom trials of this unit.

This book is a resource developed by the USMES Project: Earle L. Lomon, Project Director; Betty M. Beck, Associate Director for Development; Thomas L. Brown, Associate Director for Utilization Studies; Quinton E. Baker, Associate Director for Administration.

UNIFIED SCIENCES AND MATHEMATICS FOR ELEMENTARY SCHOOLS:
Mathematics and the Natural, Social, and Communications Sciences in Real Problem Solving.

School Rules

Second Edition


Monique
Respect for others
If you fell down the stairs and someone helped you thatmeans he or she cares about you.So someday if something happens to that person that helped you. you should help that person.
obey the rules
Obey The School Rules

Education Development Center, Inc.
55 Chapel Street
Newton, MA 02160

Trial Edition

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CHALLENGE: FIND WAYS OF INFLUENCING RULES AND THE DECISION-MAKING PROCESS IN THE SCHOOL.

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Preface

The USMES Project

Unified Sciences and Mathematics for Elementary Schools: Mathematics and the Natural, Social, and Communications Sciences in Real Problem Solving (USMES) was formed in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools.* Since its inception in 1970, USMES has been funded by the National Science Foundation to develop and carry out field trials of interdisciplinary units centered on long-range investigations of real and practical problems (or "challenges") taken from the local school/community environment. School planners can use these units to design a flexible curriculum for grades kindergarten through eight in which real problem solving plays an important role.

Development and field trials were carried out by teachers and students in the classroom with the assistance of university specialists at workshops and at occasional other meetings. The work was coordinated by a staff at the Education Development Center in Newton, Massachusetts. In addition, the staff at EDC coordinated implementation programs involving schools, districts, and colleges that are carrying out local USMES implementation programs for teachers and schools in their area.

Trial editions of the following units are currently available:

- Advertising
- Bicycle Transportation
- Classroom Design
- Classroom Management
- Consumer Research
- Describing People
- Designing for Human Proportions
- Design Lab Design
- Eating in School
- Getting There
- Growing Plants
- Manufacturing
- Mass Communications
- Nature Trails
- Orientation
- Pedestrian Crossings
- Play Area Design and Use
- Protecting Property
- School Rules
- School Supplies
- School Zoo
- Soft Drink Design
- Traffic Flow
- Using Free Time
- Ways to Learn/Teach
- Weather Predictions

*See *Goals for the Correlation of Elementary Science and Mathematics*, Houghton Mifflin Co., Boston, 1969.

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USMES Resources

In responding to a long-range challenge, the students and teachers often have need of a wide range of resources. In fact, all of the people and materials in the school and community are important resources for USMES activities. In addition USMES provides resources for both teachers and students. A complete set of all the written materials comprise the USMES library, which should be available in each school using USMES units. These materials include--

1. *The USMES Guide*: This book is a compilation of materials that may be used for long-range planning of a curriculum that incorporates the USMES program. It describes the USMES project, real problem solving, classroom strategies, the Design Lab, the units, and the support materials as well as ways that USMES helps students learn basic skills.

2. *Teacher Resource Books* (one for each challenge): Each of these guides to using USMES units describes a broad problem, explains how students might narrow that problem to fit their particular needs, recommends classroom strategies, presents edited logs from teachers whose classes have worked on the unit, and contains charts that indicate basic skills, processes, and areas of study that students may learn and utilize.

3. *Design Lab Manual*: This guide helps teachers and administrators set up, run, and use a Design Lab--a place with tools and materials in which the students can build things they need for their work on USMES. A Design Lab may be a corner of a classroom, a portable cart, or a separate room. Because many "hands-on" activities may take place in the classroom, every USMES teacher should have a Design Lab Manual.

4. *"How To" Series*: These student materials provide information to students about specific problems that may arise during USMES units. The regular *"How To" Series* covers problems in measuring, graphing, data handling, etc., and is available in two versions--a series of

cartoon-style booklets for primary grades and a series of magazine-style booklets with more reading matter for upper grades. The *Design Lab "How To" Series* is available in two illustrated card versions--one for primary grades and one for upper grades. A complete list of the *"How To" Series* can be found in the *USMES Guide*.

5. *Background Papers*: These papers, correlated with the *"How To" Series*, provide teachers with information and hints that do not appear in the student materials. A complete list can be found in the *USMES Guide*.

6. *Curriculum Correlation Guide*: By correlating the twenty-six USMES units with other curriculum materials, this book helps teachers to integrate USMES with other school activities and lessons.

The preceding materials are described in brief in the USMES brochure, which can be used by teachers and administrators to disseminate information about the program to the local community. A variety of other dissemination and implementation materials are also available for individuals and groups involved in local implementation programs. They include *Preparing People for USMES: An Implementation Resource Book*, the USMES slide/tape show, the Design Lab slide/tape show, the Design Lab brochure, videotapes of classroom activities, a general report on evaluation results, a map showing the locations of schools conducting local implementation of USMES, a list of experienced USMES teachers and university consultants, and newspaper and magazine articles.

* * * * *

Because Tri-Wall was the only readily available brand of three-layered cardboard at the time the project began, USMES has used it at workshops and in schools; consequently, references to Tri-Wall can be found throughout the Teacher Resource Books. The addresses of suppliers of three-layered cardboard can be found in the Design Lab Manual.

Introduction

Using the Teacher Resource Book

When teachers try a new curriculum for the first time, they need to understand the philosophy behind the curriculum. The USMES approach to student-initiated investigations of real problems is outlined in section A of this Teacher Resource Book.

Section B starts with a brief overview of possible student activities arising from the challenge; comments on prerequisite skills are included. Following that is a discussion of the classroom strategy for USMES real problem-solving activities, including introduction of the challenge, student activity, resources, and Design Lab use. Subsequent pages include a description of the use of the unit in primary grades, a flow chart and a composite log that indicate the range of possible student work, and a list of questions that the teacher may find useful for focusing the students' activities on the challenge.

Because students initiate all the activities in response to the challenge and because the work of one class may differ from that undertaken by other classes, teachers familiar with USMES need to read only sections A and B before introducing the challenge to students.

Section C of this book is the documentation section. These edited teachers' logs show the variety of ways in which students in different classes have worked at finding a solution to the challenge.

Section D contains a list of the titles of relevant sets of "How To" Cards and brief descriptions of the Background Papers pertaining to the unit. Also included in section D is a glossary of the terms used in the Teacher Resource Book and an annotated bibliography.

Section E contains charts that indicate the comparative strengths of the unit in terms of real problem solving, mathematics, science, social science, and language arts. It also contains a list of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in the unit. These charts and lists are based on documentation of activities that have taken place in USMES classes. Knowing ahead of time which basic skills and processes are likely to be utilized, teachers can postpone teaching that part of their regular program until later in the year. At that time students can study them in the usual way if they have not already learned them as part of their USMES activities.

A. Real Problem Solving and USMES

*If life were of such a constant nature that there were only a few chores to do and they were done over and over in exactly the same way, the case for knowing how to solve problems would not be so compelling. All one would have to do would be to learn how to do the few jobs at the outset. From then on he could rely on memory and habit. Fortunately--or unfortunately depending upon one's point of view--life is not simple and unchanging. Rather it is changing so rapidly that about all we can predict is that things will be different in the future. In such a world the ability to adjust and to solve one's problems is of paramount importance.**

Real Problem Solving

USMES is based on the beliefs that real problem solving is an important skill to be learned and that many math, science, social science, and language arts skills may be learned more quickly and easily within the context of student investigations of real problems. Real problem solving, as exemplified by USMES, implies a style of education which involves students in investigating and solving real problems. It provides the bridge between the abstractions of the school curriculum and the world of the student. Each USMES unit presents a problem in the form of a challenge that is interesting to children because it is both real and practical. The problem is real in several respects: (1) the problem applies to some aspect of student life in the school or community, (2) a solution is needed and not presently known, at least for the particular case in question, (3) the students must consider the entire situation with all the accompanying variables and complexities, and (4) the problem is such that the work done by the students can lead to some improvement in the situation. This expectation of useful accomplishment provides the motivation for children to carry out the comprehensive investigations needed to find some solution to the challenge.

The level at which the children approach the problems, the investigations that they carry out, and the solutions

*Kenneth B. Henderson and Robert E. Pingry, "Problem-Solving in Mathematics," in *The Learning of Mathematics: Its Theory and Practice*, Twenty-first Yearbook of the National Council of Teachers of Mathematics (Washington, D.C.: The Council, 1953), p. 233.

that they devise may vary according to the age and ability of the children. However, real problem solving involves them, at some level, in all aspects of the problem-solving process: definition of the problem; determination of the important factors in the problem; observation; measurement; collection of data; analysis of the data using graphs, charts, statistics, or whatever means the students can find; discussion; formulation and trial of suggested solutions; clarification of values; decision making; and communications of findings to others. In addition, students become more inquisitive, more cooperative in working with others, more critical in their thinking, more self-reliant, and more interested in helping to improve social conditions.

The USMES Approach

To learn the process of real problem solving, the students must encounter, formulate, and find some solution to complete and realistic problems. The students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of their hypotheses and conclusions. In real problem-solving activities, the teacher acts as a coordinator and collaborator, not an authoritative answer-giver.

The problem is first reworded by students in specific terms that apply to their school or community, and the various aspects of the problem are discussed by the class. The students then suggest approaches to the problem and set priorities for the investigations they plan to carry out. A typical USMES class consists of several groups working on different aspects of the problem. As the groups report periodically to the class on their progress, new directions are identified and new task forces are formed as needed. Thus, work on an USMES challenge provides students with a "discovery-learning" or "action-oriented" experience.

Real problem solving does not rely solely on the discovery-learning concept. In the real world people have access to certain facts and techniques when they recognize the need for them. The same should be true in the classroom. When the students find that certain facts and skills are necessary for continuing their investigation, they learn willingly and quickly in a more directed way to acquire these facts and skills. Consequently, the students should have available different resources that they may use as they recognize the need for them, but they should still be left with a wide scope to explore their own ideas and methods.

Certain information on specific skills is provided by the sets of USMES "How To" Cards. The students are referred only to the set for which they have clearly identified a need and only when they are unable to proceed on their own. Each "How To" Cards title clearly indicates the skill involved--"How to Use a Stopwatch," "How to Make a Bar Graph Picture of Your Data," etc. (A complete list of the "How To" Cards can be found in Chapter IX of the USMES Guide.)

Another resource provided by USMES is the Design Lab or its classroom equivalent. The Design Lab provides a central location for tools and materials where devices may be constructed and tested without appreciably disrupting other classroom activities. Ideally, it is a separate room with space for all necessary supplies and equipment and work space for the children. However, it may be as small as a corner of the classroom and may contain only a few tools and supplies. Since the benefits of real problem solving can be obtained by the students only if they have a means to follow up their ideas, the availability of a Design Lab can be a very important asset.

Optimally, the operation of the school's Design Lab should be such as to make it available to the students whenever they need it. It should be as free as possible from set scheduling or programming. The students use the Design Lab to try out their own ideas and/or to design, construct, test, and improve many devices initiated by their responses to the USMES challenges. While this optimum operation of the Design Lab may not always be possible due to various limitations, "hands-on" activities may take place in the classroom even though a Design Lab may not be available. (A detailed discussion of the Design Lab can be found in Chapter VI of the USMES Guide, while a complete list of "How To" Cards covering such Design Lab skills as sawing, gluing, nailing, soldering, is contained in Chapter IX.)

Work on all USMES challenges is not only sufficiently complex to require the collaboration of the whole class but also diverse enough to enable each student to contribute according to his/her interest and ability. However, it should be noted that if fewer than ten to twelve students from the class are carrying out the investigation of a unit challenge, the extent of their discovery and learning can be expected to be less than if more members of the class are involved. While it is possible for a class to work on two related units at the same time, in many classes the students progress better with just one.

The amount of time spent each week working on an USMES challenge is crucial to a successful resolution of the

problem. Each challenge is designed so that the various investigations will take from thirty to forty-five hours, depending on the age of the children, before some solution to the problem is found and some action is taken on the results of the investigations. Unless sessions are held at least two or three times a week, it is difficult for the children to maintain their interest and momentum and to become involved intensively with the challenge. The length of each session depends upon the age level of the children and the nature of the challenge. For example, children in the primary grades may proceed better by working on the challenge more frequently for shorter periods of time, perhaps fifteen to twenty minutes, while older children may proceed better by working less frequently for much longer periods of time.

Student interest and the overall accomplishments of the class in finding and implementing solutions to the challenge indicate when the class's general participation in unit activities should end. (Premature discontinuance of work on a specific challenge is often due more to waning interest on the part of the teacher than to that of the students.) However, some students may continue work on a voluntary basis on one problem, while the others begin to identify possible approaches to another USMES challenge.

Importance of the Challenge

Although individual (or group) discovery and student initiation of investigations is the process in USMES units, this does not imply the constant encouragement of random activity. Random activity has an important place in children's learning, and opportunities for it should be made available at various times. During USMES activities, however, it is believed that children learn to solve real problems only when their efforts are focused on finding some solution to the real and practical problem presented in the USMES challenge. It has been found that students are motivated to overcome many difficulties and frustrations in their efforts to achieve the goal of effecting some change or at least of providing some useful information to others. Because the children's commitment to finding a solution to the challenge is one of the keys to successful USMES work, it is extremely important that the challenge be introduced so that it is accepted by the class as an important problem to which they are willing to devote a considerable amount of time.

The challenge not only motivates the children by stating the problem but also provides them with a criterion for judging their results. This criterion--if it works, it's right (or if it helps us find an answer to our problem, it's

a good thing to do)--gives the children's ideas and results a meaning within the context of their goal. Many teachers have found this concept to be a valuable strategy that not only allows the teacher to respond positively to all of the children's ideas but also helps the children themselves to judge the value of their efforts.

Role of the Teacher

With all of the above in mind, it can be said that the teacher's responsibility in the USMES strategy for open classroom activities is as follows:

1. Introduce the challenge in a meaningful way that not only allows the children to relate it to their particular situation but also opens up various avenues of approach.

2. Act as a coordinator and collaborator. Assist, not direct, individuals or groups of students as they investigate different aspects of the problem.

3. Hold USMES sessions at least two or three times a week so that the children have a chance to become involved in the challenge and carry out comprehensive investigations.

4. Provide the tools and supplies necessary for initial hands-on work in the classroom or make arrangements for the children to work in the Design Lab.

5. Be patient in letting the children make their own mistakes and find their own way. Offer assistance or point out sources of help for specific information (such as the "How To" Cards) only when the children become frustrated in their approach to the problem. Conduct skill sessions as necessary.

6. Provide frequent opportunities for group reports and student exchanges of ideas in class discussions. In most cases, students will, by their own critical examination of the procedures they have used, improve or set new directions in their investigations.

7. If necessary, ask appropriate questions to stimulate the students' thinking so that they will make more extensive and comprehensive investigations or analyses of their data.

8. Make sure that a sufficient number of students (usually ten to twelve) are working on the challenge so that activities do not become fragmented or stall.

Student success in USMES unit activities is indicated by the progress they make in finding some solution to the challenge, not by following a particular line of investigation nor by obtaining specified results. The teacher's role in the USMES strategy is to provide a classroom atmosphere in which all students can, in their own way, search out some solution to the challenge.

USMES in the Total School Program

Today many leading educators feel that real problem solving (under different names) is an important skill to be learned. In this mode of learning particular emphasis is placed on developing skills to deal with real problems rather than the skills needed to obtain "correct" answers to contrived problems. Because of this and because of the interdisciplinary nature of both the problems and the resultant investigations, USMES is ideal for use as an important part of the elementary school program. Much of the time normally spent in the class on the traditional approaches to math, science, social science, and language arts skills can be safely assigned to USMES activities. In fact, as much as one-fourth to one-third of the total school program might be allotted to work on USMES challenges. Teachers who have worked with USMES for several years have each succeeding year successfully assigned to USMES activities the learning of a greater number of traditional skills. In addition, reports have indicated that students retain for a long time the skills and concepts learned and practiced during USMES activities. Therefore, the time normally spent in reinforcing required skills can be greatly reduced if these skills are learned and practiced in the context of real problem solving.

Because real problem-solving activities cannot possibly cover all the skills and concepts in the major subject areas, other curricula as well as other learning modes (such as "lecture method," "individual study topics," or programmed instruction) need to be used in conjunction with USMES in an optimal education program. However, the other

instruction will be enhanced by the skills, motivation, and understanding provided by real problem solving, and, in some cases, work on an USMES challenge provides the context within which the skills and concepts of the major subject areas find application.

In order for real problem solving taught by USMES to have an optimal value in the school program, class time should be apportioned with reason and forethought, and the sequence of challenges investigated by students during their years in elementary school should involve them in a variety of skills and processes. Because all activities are initiated by students in response to the challenge, it is impossible to state unequivocally which activities will take place. However, it is possible to use the documentation of activities that have taken place in USMES trial classes to schedule instruction on the specific skills and processes required by the school system. Teachers can postpone the traditional way of teaching the skills that might come up in work on an USMES challenge until later in the year. At that time students can learn the required skills in the usual way if they have not already learned them during their USMES activities.

These basic skills, processes, and areas of study are listed in charts and lists contained in each Teacher Resource Book. A teacher can use these charts to decide on an overall allocation of class time between USMES and traditional learning in the major subject disciplines. Examples of individual skills and processes are also given so that the teacher can see beforehand which skills a student may encounter during the course of his investigations. These charts and lists may be found in section E.

Ways In Which USMES Differs From Other Curricula

As the foregoing indicates, USMES differs significantly from other curricula. Real problem solving develops the problem-solving ability of students and does it in a way (learning-by-doing) that leads to a full understanding of the process. Because of the following differences, some teacher preparation is necessary. Some teachers may have been introduced by other projects to several of the following new developments in education, but few teachers have integrated all of them into the new style of teaching and learning that real problem solving involves.

1. New Area of Learning--Real problem solving is a new area of learning, not just a new approach or a new content within an already-defined subject area. Although many subject-matter curricula

include something called problem solving, much of this problem solving involves contrived problems or fragments of a whole situation and does not require the cognitive skills needed for the investigation of real and practical problems. Learning the cognitive strategy required for real problem solving is different from other kinds of learning.

3. Interdisciplinary Education--Real problem solving integrates the disciplines in a natural way; there is no need to impose a multi-disciplinary structure. Solving real and practical problems requires the application of skills, concepts, and processes from many disciplines. The number and range of disciplines are unrestricted and the importance of each is demonstrated in working toward the solution of practical problems.

3. Student Planning--To learn the process of problem solving, the students themselves, not the teacher, must analyze the problem, choose the variables that should be investigated, search out the facts, and judge the correctness of the hypotheses and conclusions. In real problem-solving activities the teacher acts as a coordinator and collaborator, not as an authoritative source of answers.

4. Learning-by-Doing--Learning-by-doing, or discovery learning as it is sometimes called, comes about naturally in real problem solving since the problems tackled by each class have unique aspects; for example, different lunchrooms or pedestrian crossings have different problems associated with them and, consequently, unique solutions. The challenge, as defined in each situation, provides the focus for the children's hands-on learning experiences, such as collecting real data; constructing measuring instruments, scale models, test equipment, etc.; trying their suggested improvements; and (in some units) preparing reports and presentations of their findings for the proper authorities.

5. Learning Skills and Concepts as Needed--Skills and concepts are learned in real problem solving

as the need for them arises in the context of the work being done, rather than having a situation imposed by the teacher or the textbook being used. Teachers may direct this learning when the need for it arises, or students may search out information themselves from resources provided.

6. Group Work--Progress toward a solution to a real problem usually requires the efforts of groups of students, not just individual students working alone. Although some work may be done individually, the total group effort provides good opportunities for division of labor and exchange of ideas among the groups and individuals. The grouping is flexible and changes in order to meet the needs of the different stages of investigation.

7. Student Choice--Real problem solving offers classes the opportunity to work on problems that are real to them, not just to the adults who prepare the curriculum. In addition, students may choose to investigate particular aspects of the problem according to their interest. The variety of activities ensuing from the challenge allows each student to make some contribution towards the solution of the problem according to his or her ability and to learn specific skills at a time when he or she is ready for that particular intellectual structure.

B. General Papers on School Rules

1. OVERVIEW OF ACTIVITIES

Challenge:

Find ways of influencing rules and the decision-making process in the school.

Possible Class Challenges:

How can we remind children in the school to obey the school rules?

How can we change the way school rules are made?

Children always have something to say about their school rules. The small children complain that the older children do not obey the school rules. In turn, the older children complain that they either do not know the rules or feel that the rules are ineffective. Given an opportunity, the children are eager to investigate what the school rules are, to publicize the rules, and to try to change those rules found to be unnecessary. Students in the intermediate or middle school grades may investigate the decision-making process of the school and recommend changes, if needed.

The School Rules challenge may arise naturally from work on other USMES units, such as when the class investigates rules regulating the playground (Play Area Design and Use), the classroom (Classroom Management), or the Design Lab (Design Lab Design). In some classes the challenge may arise after children complain about a particular school rule. In other classes the introduction of new students to the school may bring about a discussion of what the school rules are.

During an initial discussion of the challenge, the children may realize that they are not familiar with all the school rules. One of their first tasks then may be to find out from the principal and other school personnel what the school rules are. A schoolwide opinion survey may be conducted to determine what the children think about these rules. In analyzing the survey results, the class may discover which rules the children feel are important and which are unknown. Additional data in the form of observations within the school or interviews with parents may also be conducted.

From the preliminary data the class may identify several problems and agree to work on the one or two problems which they feel warrant their immediate attention. Plans are made and revised before trial implementation of proposed solutions is carried out. Some classes may institute a campaign to remind others to obey the school rules. This campaign may include posters, rules handbooks, or putting on plays. Other classes may identify and carry out a procedure to change a rule, or they may organize a more effective student council to deal with student complaints and to initiate new rules. During the trial implementation period the children

collect data in order to assess the effectiveness of their plan. Revisions are made accordingly and surveys may once again be conducted before the class is satisfied that the problem has been resolved.

Classes that publicize rules may also work on the challenges of Mass Communication or Advertising at the same time. Later, they may want to continue this work in other situations requiring the dissemination of information to others.

School Rules activities will lead to work on problems in other areas of the school, such as the lunchroom, the classroom, the playground, and the Design Lab. The children may pursue one of the USMES challenges that encompasses a school area, such as Eating in School, Classroom Design, Classroom Management, Play Area Design and Use, and Design Lab Design.

Although some of the School Rules activities may require skills and concepts new to the children, there is no need for preliminary work on them because the children can learn them when the need arises. In fact, children learn more quickly and easily when they see a need to learn. Consider counting: whereas children usually learn to count by rote, they can through USMES, gain a better understanding of counting by learning or practicing it within real contexts. In working on School Rules children also learn and practice graphing, measuring, working with decimals, and dividing. Although dividing seems necessary to compare fractions or ratios, primary children can make comparisons graphically; sets of data can also be compared graphically or by subtracting medians (half-way values).

2. CLASSROOM STRATEGY FOR SCHOOL RULES

The School Rules unit centers around a challenge--a statement that says, "Solve this problem." Its success or failure in a classroom depends largely on (1) the relevance of the problem for the students and (2) the process by which they define and accept the challenge. If the children see the problem as a real one, they will be committed to finding a solution; they will have a focus and purpose for their activities. If the students do not think the problem affects them, their attempts at finding solutions will likely be disjointed and cursory.

The School Rules challenge--"Find ways of influencing rules and the decision-making process in the school"--is general enough to apply to many situations. Students in

different classes define and reword the challenge to fit their particular situation and thus arrive at a specific class challenge. For example, one class worked on the challenge of reminding students in the school to obey the school rules. Two other classes investigated the challenge of ways to change some of the school rules.

The Process of Introducing the Challenge

Given that a problem exists, how can a teacher, without being directive, help the students identify the challenge that they will work on as a group? There is no set method because of variations among teachers, classes, and schools and among the USMES units themselves. However, USMES teachers have found that certain general techniques in introducing the challenge are helpful.

One such technique is to turn a discussion of some recent event toward the challenge. For example, a discussion of a situation in which several students were asked by a teacher to return to the cafeteria to eat their desserts may lead to a School Rules challenge.

On the first day of school one intermediate teacher read the new rules of the discipline code to her students. These new rules were made by the new principal. The class was outraged with the rule, "No gum chewing," because the students in the school had just received last year the privilege of chewing gum. The class worked hard to obtain proof for the principal that students chewed gum despite his rule and that students could be responsible for managing all gum chewing in participating classes should the rule be abolished.

Students in one eighth-grade class complained for several weeks about not having any privileges at school. Finally, they discussed the problem and decided to do something about it. The class determined one privilege that the entire eighth grade level wished and spent much time working to obtain it.

Sometimes work on another challenge, such as Classroom Management, Play Area Design and Use, or Eating in School, may lead to a School Rules challenge.

Two third-grade classes examined and compared classroom rules before expanding their investigations to school rules. One of the classes learned that there were no school rules for the whole school; rather, each level (there were three levels in the school) had its own rules. The class collected the rules from each of these levels and compiled a set of rules that was applicable to all students in the school.

When children encounter a problem that leads to a challenge that is related to School Rules, one group of children may begin work on this second challenge while the rest of the class continues with the first challenge. However, there should be at least ten to twelve students working on any one challenge; otherwise, the children's work may be fragmented or superficial or may break down completely.

A School Rules challenge may also evolve from a discussion of a specific topic being studied by the class. For example, a class may become interested in how school rules are made after studying how state or city laws are made.

Sometimes the discussion of a broad problem may encompass the challenges of several related units. For example, the problem of confusion on the first day of school may lead to a discussion of the possible causes of this problem and then to one of several challenges, such as, School Rules, Classroom Management, Mass Communications, Getting There, or Orientation. Another broad problem that sometimes arises is that of safety. A discussion on this topic may lead to the challenges of School Rules, Play Area Design and Use, Design Lab Design, or Eating in School.

An experienced USMES teacher is usually willing to have the children work on any one of the several challenges that may arise during the discussion of a broad problem. While this approach gives the chidren the opportunity to select the challenge they are most interested in investigating, it does place on the teacher the additional responsibility of being prepared to act as a resource person for whichever challenge is chosen.

Classroom experience has shown that children's progress on the School Rules challenge may be poor if the teacher and students do not reach a common understanding of what their challenge is before beginning work on it. Having no shared focus for their work, the children will lack the motivation inherent in working together to solve a real problem. As a result, they may quickly lose interest.

One combination third- and fourth-grade class did not agree on a challenge before beginning School Rules activities. The class compiled an exhaustive list of possible school rules. The teacher then allowed the children to do whatever they wanted with this list. One group of children established a surveillance program that posed the unsolvable problem of what to do with those children who broke a rule. Several other children chose to make posters and lists reminding students and teachers to obey these rules. Within six weeks the children were finished with their activities.

A similar situation occurs if the teacher, rather than ensuring that the children have agreed upon a challenge, merely assigns a series of activities. Although the teacher may see how these activities relate to an overall goal, the children may not.

Initial Work on the Challenge

Once a class has decided to work on a School Rules challenge, USMES sessions should be held several times a week, but they need not be rigidly scheduled. When sessions are held after long intervals, students often have difficulty remembering exactly where they were in their investigations and their momentum diminishes.

When students begin work on their particular challenge, they discuss and list possible ways to resolve the problem, such as altering a school rule or reminding everyone what the school rules are. Many times this procedure is combined with or followed by preliminary observations and/or opinion surveys.

Eighth-grade students in one school worked on obtaining special privileges for students in their grade level. Not knowing which privilege most eighth graders wished, the students conducted an opinion survey. Each student was asked to write down the one privilege he or she wanted the most. Based on the survey results, several privileges emerged as most desired. The class then worked on obtaining one of these privileges.

Next, the class sets priorities for the tasks they consider necessary to complete their plans. Often a class

divides into small groups to carry out the tasks. As various groups complete their work, their members join other groups or form new groups to work on additional tasks.

Children in one third-grade class divided into small groups to gather information and opinions from different sources. To find out what the rules were in each of the three school levels, they formed small groups. The information they obtained was then shared with the whole class. Small groups were also formed when the class conducted opinion surveys among the various classes. Within the small groups the children assigned tasks because some of the group members were either too shy to talk in front of a class or were unfamiliar with the English language.

However, if too many groups are formed, work on the challenge can become fragmented. The teacher finds it impossible to be aware of the progress and problems of each group; in addition, the small number of students in each group lessens the chance for varied input and interaction.

Trials of the unit have shown that the children's investigations of school rules tend to go more smoothly with the cooperation of the school principal, school staff, and other school personnel. The children may want first to inform the principal of their intentions before proceeding with their plans.

One third-grade class received considerable encouragement from the school principal after the teacher mentioned that her class wanted to investigate school rules. The principal told the children that he would consider their recommendations for revising a rule if they could provide good evidence for the need.

Refocusing on the Challenge

As the children work on their challenge, their attention should, from time to time, be refocused on it so that they do not lose sight of their overall goal. Refocusing is particularly important with younger children because they have a shorter attention span. Teachers find it helpful to hold periodic class discussions that include group reports. Such sessions help the students review what they have accomplished

and what they still need to do in order to carry out their proposed plans. These discussions also provide an opportunity for students to participate both in evaluating their own work and in exchanging ideas with their classmates. (Another consequence of having too many groups is that not every group can be given enough time to report to the class, thereby increasing the possibility that the children's efforts will overlap unnecessarily.)

Resources for Work on the Challenge

When children try to decide on solutions before collecting and analyzing enough data or encounter difficulties during their investigations, an USMES teacher helps out. Instead of giving answers or suggesting specific procedures, the teacher asks open-ended questions that stimulate the students to think more comprehensively and creatively about their work. For example, instead of telling the students that they may have to conduct an opinion survey among other classes to gather data, the teacher may ask, "What would be a good way to find out how other students felt about the rules?" "Which rule do students dislike the most?" Examples of other nondirective, thought-provoking questions may be found in section B6 of this resource book.

The teacher may also refer students to the "How To" Cards which provide information about specific skills, such as drawing graphs or analyzing data. If many students, or even the entire class, need help in particular areas, such as using fractions, the teacher should conduct skill sessions as these needs arise. (Background Papers provide teachers with additional information on general topics applicable to most challenges.)

USMES teachers can also assist students by making it possible for them to carry out tasks involving hands-on activities. If the children need to collect data outside of the school, the teacher can help with supervision. If the children's tasks require them to design and construct items, the teacher should make sure that they have access to a Design Lab.

Valuable as it is, a Design Lab is not necessary to begin work on a School Rules challenge. The lab is used only when needed, and this need may not arise during early work on the challenge. To carry out construction activities in schools without Design Labs, students may scrounge or borrow tools and supplies from parents, local businesses, or other members of the community.

At times some classes may not need to use the Design Lab at all; the extent to which the Design Lab is used varies

with different classes and different units because the children themselves determine the direction of the investigations and because construction activities are more likely to occur in some units than in others.

In their effort to obtain a Friday afternoon free period, one class of eighth-grade students did not use the Design Lab. Considerable amount of their time was spent surveying the other eighth-grade students and talking with the assistant principal and school faculty.

Culminating Activities

Student investigations generally continue until the children have agreed upon and implemented some solution to their problem. They may reduce rules violations because of their rules handbooks and posters, or they may succeed in altering a rule.

The eighth-grade class learned from the faculty that student behavior had to improve before they would consent to their request for a Friday afternoon free period for the entire eighth-grade level. After several weeks of improving their behavior, the whole eighth grade was granted this Friday privilege.

After the plan or change has been in effect for a period of time the class evaluates it. If they feel that the change has met satisfactorily their challenge, they then turn their attention to other concerns.

3. USE OF SCHOOL RULES IN THE PRIMARY GRADES

Children in the primary grades may make significant progress with the School Rules challenge of finding ways to influence rules and the decision-making process in the school. Although their entry level to the challenge and their sophistication with the investigation will certainly be different from that of older children, they will be able to propose possible solutions, collect and interpret data, and take effective action to meet their challenge.

Small children are usually very conscious of the school rules, making an effort to obey them. Many times they become upset if they see older children breaking a rule, such as pushing in the line. A teacher might encourage the discussion of an event and then introduce the challenge. Several children might comment that recess went well that day because there were no fights over the swings, or a child might complain that the older children have written all over their pictures hung in the hallway. The class may discuss how important rules are for safety and for pleasure and may review problems with existing school rules. The children may then decide which problems are urgent enough to be worked on first. For example, children in one third-grade class spent the first day of school without any classroom rules. At the end of the day the class reflected upon the numerous incidents that had occurred and became interested in examining classroom rules. Later they expanded their interest to school rules.

In classes where the children are familiar with small group work, they form groups to carry out tasks that they have identified as needing to be done. With less experienced children the teacher may find it beneficial in the beginning for the whole class to work on one problem at a time. Gradually, as the children become more able to follow through on their proposed plans, the teacher may encourage the class to divide the various tasks among small groups. For example, one third-grade class divided their task of conducting an opinion survey among small groups. Group size was determined by the number of classes to be surveyed and the number of students in their class. Within the small group there was further division of labor because different group members were good at doing different tasks.

In addition to being efficient, small group work also provides opportunities to practice oral skills and to exchange ideas. After completing their investigations, which may have included interviews with school personnel, faculty, and the principal, the members of a group organize their findings and then present them to the class for discussion. Small groups in one third-grade class shared with the class the results of their interviews with the three school principals. Based on this information, the class made a decision to compile a list of rules that would be applicable to all three schools.

Other language arts skills are learned and practiced frequently during School Rules activities. The children pay careful attention to their spelling, grammar, and composi-

tion when they write opinion surveys, letters, posters, and handbooks of rules. Several third graders in one class wrote letters to their principal explaining why they disagreed with some of the school rules. Other children in this same class prepared rules handbooks which were placed in the school library for other children in the school to check out. Another third-grade class spent considerable time rewording some school rules so that they would not sound so negative. Most of the children relied on their dictionaries to check the meanings of the words they used.

Methods for gathering information and opinions on school rules soon become important when the children realize that their opinions represent only a small portion of the entire school. The interview and opinion survey are seen as good ways to obtain the needed data. Preparing for the survey, the children make decisions about what questions should be asked, who should be surveyed and how many, how to make arrangements to visit the various classes or people, and how to divide the tasks so that maximum results may be obtained with the least amount of redundancy and effort. One third-grade class compiled a list of rules that they felt could be rules for the whole school. They obtained faculty and principals' opinions on these rules by using an opinion survey. The survey was placed in every mailbox with a letter summarizing their School Rules activities. In another third-grade class an interview with the principal helped the children accept rules that they found objectionable.

The problem of what to do with rule offenders frequently arises. Resolution of this problem is obviously difficult, and the class engages in many discussions on what is considered a fair penalty and how they can catch offenders without impinging on rights of privacy. Children in one third-grade class decided, after much discussion, that they were not interested in who violated a rule but rather in which rule was violated. This decision was based mostly on their agreement that it would be hard to deal with older violators who might not reveal their names or who might make fun of the small children. The children observed in the halls for several weeks, tallying the number of times a rule was broken. Rules that were violated the most were written on posters to remind students to obey them.

Tallying and graphing is easily introduced to primary children as they see the need to organize and make pictures of their information. Classroom experience has shown that small children are able to understand and make decisions based on simple graphs. If the children want to find an

"average," they can use the median which is easier to find than an average and is, in many cases, a better number to use. If there is a need to compare percentages, such as the percentage of children in different grades who think that a rule is important, the children can make a slope diagram, which provides a visual comparison of ratios or percentages.

Experience in many schools has shown that primary children are able to work in the Design Lab and are able to use the power tools with some adult assistance. In a third-grade class many children used the saber saw and electric drill to make small signs and pendants from Tri-Wall. On the pendants many children put the letters "O.T.S.R.," standing for Obey the School Rules. Children in primary grades working on other USMES challenges have designed and built tables, boxes, and even sandals from Tri-Wall or lumber.

4. FLOW CHART

The following flow chart presents some of the student activities--discussions, observations, calculations, constructions--that may occur during work on a School Rules challenge. Because each class will choose its own approach to a challenge, sequences of events given here represent only a few of the many possible variations. Furthermore, no one class is expected to undertake all the activities listed.

The flow chart is not a lesson plan and should not be used as one. Instead, it illustrates how comprehensive investigations evolve from the students' discussion of a School Rules problem.

Challenge: Find ways of influencing rules and the decision-making process in the school.

Optional Preliminary Activities:

USMES Units:
- *Play Area Design and Use*
- *Classroom Management*
- *Classroom Design*
- *Design Lab Design*
- *Eating in School*
- *Mass Communications*

Social Studies unit on government

Possible Student Activities:

Class Discussion: How do you feel about the school rules? What are the school rules? Who makes the school rules? How do other students feel about the rules? How can we find out about the above questions?

Data Collection: Interview with teachers, principal, and other school personnel to determine school rules. Examination of school handbook on rules.

Data Collection: Survey of teachers, students, and school personnel to determine the number of people who know the school rules, what rules are good or unpopular, which rules are most important, etc.

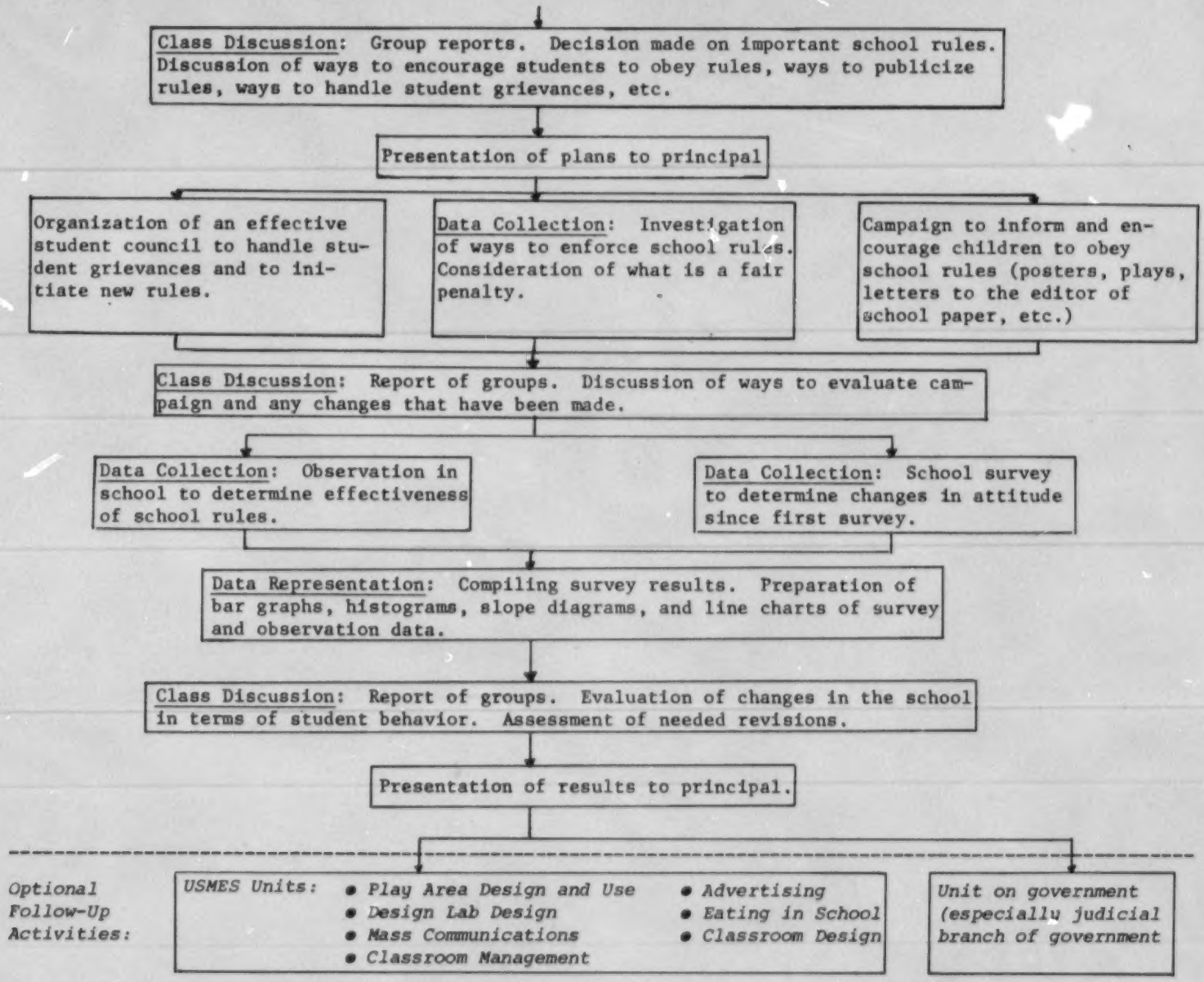
Data Representation: Compiling survey results. Preparation of bar graphs, histograms, slope diagrams and line charts of survey data.

Class Discussion: Group reports on survey and interview data. Discussion of rules, whether new ones are needed or old ones need revision. Discussion of ways to assess the effectiveness of present school rules.

Data Collection: Investigation of the decision-making process (who makes the rules, how can rules be changed or new rules made).

Data Collection: Observation of school (halls, lunchroom, playground, etc.) to determine effectiveness of old rules, frequency rules are obeyed, etc.

Data Representation: Preparation of bar graphs, histograms, and line charts of observation data.


Class Discussion: Group reports. Decision made on important school rules. Discussion of ways to encourage students to obey rules, ways to publicize rules, ways to handle student grievances, etc.
Presentation of plans to principal
Organization of an effective student council to handle student grievances and to initiate new rules.
Data Collection: Investigation of ways to enforce school rules. Consideration of what is a fair penalty.
Campaign to inform and encourage children to obey school rules (posters, plays, letters to the editor of school paper, etc.)
Class Discussion: Report of groups. Discussion of ways to evaluate campaign and any changes that have been made.
Data Collection: Observation in school to determine effectiveness of school rules.
Data Collection: School survey to determine changes in attitude since first survey.
Data Representation: Compiling survey results. Preparation of bar graphs, histograms, slope diagrams, and line charts of survey and observation data.
Class Discussion: Report of groups. Evaluation of changes in the school in terms of student behavior. Assessment of needed revisions.
Presentation of results to principal.
Optional Follow-Up Activities:
USMES Units:
• Play Area Design and Use
• Design Lab Design
• Mass Communications
• Classroom Management
• Advertising
• Eating in School
• Classroom Design
Unit on government (especially judicial branch of government

5. A COMPOSITE LOG*

This hypothetical account of a sixth-grade class describes many of the activities and discussions mentioned in the flow chart. The composite log shows only one of the many progressions of events that might develop as a class investigates the School Rules challenge. Documented events from actual classes are italicized and set apart from the text.

After the children have been in school for a few days, a discussion on school rules evolves after one new student is told by a teacher to return to the lunchroom with his cookies. Confused, he asks several children in his class what the school rules are. It does not take long before the whole class is involved with the discussion.

"You're not supposed to run in school."

"No making a mess in the bathrooms."

"No marking on the walls."

Several children express surprise that eating is not allowed outside the lunchroom. Other children laugh and say that most of the rules are ridiculous anyway because kids either don't know the rules or just ignore them.

At this point the teacher asks the students if they are interested in investigating what the rules are and perhaps doing something to encourage children to obey them. The children quickly express an interest, and the teacher writes the challenge on the board—"How can we inform and remind children about the school rules?"

After comparing various classes' classroom rules, a third-grade class in Watertown, Massachusetts, felt that they were not sure what the school rules were. They decided to make a list of rules which they felt should be school rules. Their list consisted basically of safety rules and rules that prohibited the destruction of school property. (See log by Marybeth McGrail.)

Students in one eighth-grade class in Charleston, South Carolina, felt that eighth-graders should have some special privileges in school. From a long list of desired privileges the class chose two to try to obtain. (See log by Mary Ellen Warner.)

In the ensuing class discussions the children realize that they first need to determine what the school rules are. Because the teacher has only some of the rules written down, the class decides that the principal would certainly know

*Written by USMES staff

the rules! Several children volunteer to make an appointment with her. They also decide to interview the custodian because he gets around the school every day. The rest of the class agrees that once they know what the school rules are, they can survey the school population to find out whether the children know these rules and how they feel about them. The class disbands and the two groups go off to make their plans.

The following day the teacher happens to meet the principal in the hallway. She mentions what her class is doing and that a group will be soon making an appointment with her. The principal expresses encouragement because she has been noticing many children breaking the rules.

The Watertown class received considerable encouragement from their school principal after he found out that the children were planning to investigate school rules. The principal informed the children's teacher that if the students provided good reasons to change or modify a rule, he would seriously consider their recommendations. (See log by Marybeth McGrail.)

The interview group makes appointments for the following week. They agree that while they are waiting, they had better prepare a clear and succinct explanation of what their class is doing. Several days are spent making an outline. Their outline appears as follows:

1. Identify which class we're from (Mrs. B.'s sixth grade).
2. How we became interested in school rules (John's incident with his cookies, asking class what the school rules were).
3. Our intentions--find out what the rules are. Find out how everyone feels about these rules. Find ways to remind everyone to obey the rules.

Each group member makes a presentation using the outline. The rest of the members listen and critique each speaker. In the end, the group votes for one main speaker.

Children in one third-grade class in New York, New York, divided into small groups to conduct an opinion survey. Several of the groups learned quickly

that some group members were not comfortable giving oral presentations. These members either were too shy or were not familiar with the English language. The children decided that these members could do other tasks. (See log by Margaret McD. Cox.)

While the other group is finding out what the school rules are, the survey group discusses whom to survey. Shall they survey only the older children? Many group members immediately say no because they have heard their younger brothers and sisters complain many times that they feel no one obeys the school rules. One child asks the teacher for the list that contains the names and grade levels of all the teachers.

In examining the list the children estimate that there are about five classes per grade level from first through sixth grades. The group decides to survey three classes per grade level, reasoning that this would cover more than 50% of all the classes in the school. Two children compute the number of children this would involve. Assuming an average of 25 children per class, they multiply 25 children times three classes times six grade levels. They get a total of 450 children! The group gasps. Quickly realizing that they cannot possibly handle that many surveys, the children readily accept one child's proposal of only surveying a few children, say 5, from each of the three classes per grade level.

The survey group spends considerable time debating the best way to randomly choose the five children. The suggestion of taking the first or last row of students in each class was vetoed because teachers frequently put all the restless children in front so that they can be watched. The children decide they can avoid this problem by picking a diagonal row. Someone points out that Mr. J. and Miss E. do not arrange the seats in rows. Rather, their students sit in clusters.

A long silence is broken suddenly when one child suggests using the alphabetical class list and picking every fifth name on the list. The group agrees that this method is fair and would be the easiest. Rather than trying to obtain all the class lists, the children feel that they can ask the teachers to give them the five names. The children also decide to have each participating class teacher complete a survey too. They spend several days composing a letter and choosing the three classes from each grade level.

Students in the New York class wished to survey one class per grade level in their school. Six small groups were formed, each group to survey one class. At first the groups picked a class based on whether they knew and liked the teacher. It soon became evident that several groups wanted to survey the same classes. The conflict was resolved by putting in a container the names of all the teachers in one grade level. Each group then decided which grade level they wished to survey and drew a teacher's name at the appropriate time. (See log by Margaret McD. Cox.)

The interview group learns and shares with the rest of the class the rules which the principal mentioned as being important in maintaining a safe school. The five rules are—

1. No running in the school building.
2. No fighting.
3. No marking on walls.
4. No eating outside the lunchroom.
5. No staying after school after the final bell rings.

Several children are surprised that eating outside the lunchroom is not allowed. Other children express annoyance with the last rule because they want to stay after school to work on individual projects. The class agrees that the survey group must find out whether other children in the school feel the same way they do about these two rules.

Based on this class discussion, the survey group designs the survey to administer to the various classes. They agree that there are two main questions that the class is interested in finding out:

1. How many children know that the above five rules are school rules?
2. Which of the five rules do they consider important in maintaining a safe school?

Their survey (which appears on the next page) is shown to the class and is approved.

Survey on School Rules — Check (✓) Your Answer

1. No running in the school building.
   a. Did you know this was a school rule? ☐ yes ☐ no
   b. Do you think this rule is ☐ very important
      ☐ slightly important
      ☐ not important
      in maintaining a safe school?

2. No fighting.
   a. Did you know this was a school rule ☐ yes ☐ no
   b. Do you think this rule is ☐ very important
      ☐ slightly important
      ☐ not important
      in maintaining a safe school?

3. No marking on walls.
   a. Did you know this was a school rule? ☐ yes ☐ no
   b. Do you think this rule is ☐ very important
      ☐ slightly important
      ☐ not important
      in maintaining a safe school?

4. No eating outside the lunchroom.
   a. Did you know this was a school rule? ☐ yes ☐ no
   b. Do you think this rule is ☐ very important
      ☐ slightly important
      ☐ not important
      in maintaining a safe school?

5. No staying after school after the final bell rings.
   a. Did you know this was a school rule? ☐ yes ☐ no
   b. Do you think this rule is ☐ very important
      ☐ slightly important
      ☐ not important
      in maintaining a safe school?

The children discuss the letter of explanation for the teachers and agree that it should be written in ink and put in each participating teacher's mailbox. The children reason that all teachers like to receive handwritten letters rather than a dittoed sheet of paper. The children divide into six groups, each group being responsible for writing the letter for three classes. One group's letter appears as follows:

October 25, 1975

Dear Mr. J.,

We are interested in finding out what some of your students and you think about the school rules. We would like to survey a few of your students. Please give us a list of the names of every fifth child on the alphabetical class list. We would also like to know when we can give the survey to these students.

Thank you.

Students in Mrs. B.'s sixth-grade class

A week later all the surveys have been conducted, and the class discusses the best way to tally the results from all the classes. They decide that if they divide into six groups, each group can tally one grade level. They form into groups and begin tallying.

At the next class discussion, the groups combine all the data from the question about knowing or not knowing school rules onto one large chart drawn on the board. The chart appears as follows:

Did you know this was a school rule?

No. of Children	Grade Level	No running		No fighting		No marking on wall		No eating outside lunchroom		No staying after school	
		yes	no	yes	no	yes	no	yes	no	yes	no
14	1	10	4	9	5	14	0	0	14	0	14
15	2	12	3	12	3	15	0	0	15	2	13
14	3	14	0	13	1	14	0	0	14	1	13
15	4	14	1	14	1	15	0	1	14	1	14
15	5	15	0	12	3	15	0	1	14	0	15
15	6	15	0	15	0	15	0	3	12	3	12

Examining the chart on the board, the children soon realize they cannot easily compare the various classes. Several children suggest that bar graphs be made in order to compare

the number of children in the various grades who did not know which rules were school rules.

After conducting their survey on the number of students in the Junior House who did or did not know the Junior House rules, the New York class made bar graphs. Their graphs showed the number of children who did not know each house rule. (See log by Margaret McD. Cox.)

Several students in the Charleston, South Carolina, class made a bar graph showing the number of votes each desired privilege received. The graph clearly showed that most students wished to have Coke machines, to be able to leave school early, and to leave the school grounds during lunch periods. (See log by Mary Ellen Warner.)

The class divides into five groups, each group graphing the results for one rule. A few minutes pass, then one girl exclaims suddenly that the comparison among the grade levels will not be fair because in two classes only fourteen students were surveyed. The children stop work immediately.

Someone suggests surveying one more student from the two classes. Another child suggests that if they figured the percentage of children in each grade level who did not know a rule, it would not matter if the number of children per class differed. The class votes and the latter idea is picked. Together on the board the class calculates the percentage of students in each grade level who did not know the rules.

Did you know this was a school rule?
Percentage who said "no"

No. of children	Grade Level	No running	No fighting	No marking	No eating	No staying
14	1	28.5%	35.7%	0	100%	100%
15	2	20.0%	20.0%	0	100%	86.6%
14	3	0	7.1%	0	100%	92.8%
15	4	6.6%	6.6%	0	93.3%	93.3%
15	5	0	20.0%	0	93.3%	100%
15	6	0	0	0	80.0%	80%

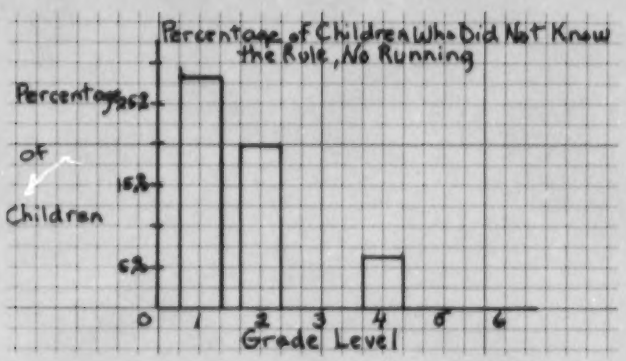


Figure B5-1

Because all the percentages do not turn out to be whole numbers, the teacher decides to give a skill session on decimals during math period. After calculating decimals to the nearest hundredth, the class agrees to round them to the nearest tenth. Each of the five groups then proceeds to draw a graph of the percentage of children who did not know a rule. Figure B5-1 shows one group's graph.

After making the graphs the class sees clearly that the "No eating" and the "No staying" rules were the least known. Several students wish to combine the five graphs onto one graph and volunteer to do this. They check with the "How To" Card file and find and use the set, "How to Show Several Sets of Data on One Graph." Figure B5-2 shows their resulting graph.

The children then wonder how these two rules compare in importance to the other three rules, and so they turn their attention to the second survey question. Another chart of the data is made.

Do you think this rule is important?

No. of Children	Grade Level	No running			No fighting			No marking on walls			No eating outside lunchroom			No staying after school		
		very	slight	not	very	slight	not	very	slight	not	very	slight	not	very	slight	not
14	1	14	0	0	14	0	0	14	0	0	0	0	14	0	4	10
15	2	13	2	0	15	0	0	15	0	0	0	3	12	0	1	14
14	3	7	4	3	13	1	0	12	2	0	0	1	13	1	0	13
15	4	2	6	7	6	9	0	10	5	0	0	1	14	0	2	13
15	5	0	5	10	5	9	1	2	13	0	0	1	14	0	2	13
15	6	0	4	11	5	8	2	4	10	1	0	1	14	0	2	13

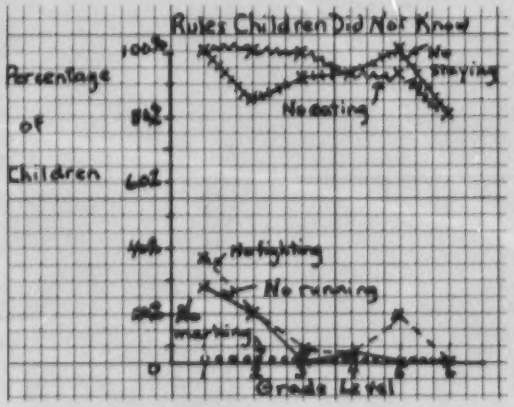


Figure B5-2

Again, the class agrees that a graph would display their data more clearly than the mass of tally totals. However, no one has any ideas on how to graph the three categories in a meaningful way.

Eventually the children decide that they can assign each response category (very important, slightly important, and not important) a certain number of points (three points for very important, two points for slightly important, and one point for not important) and then multiply the number of votes for each category times the number of points assigned to that category to obtain a total score for that response category. By adding these three totals one can obtain a grand total. The children obtain the following grand totals.

No. of Children	Grade Level	No running Grand totals	No fighting Grand totals	No marking on walls Grand totals	No eating outside lunchroom Grand totals	No staying after school Grand totals
14	1	42	42	42	14	18
15	2	43	45	45	18	16
14	3	32	41	40	15	16
15	4	25	36	40	16	17
15	5	20	34	32	16	17
15	6	19	33	33	16	17

Remembering an assignment in math class on averages, one boy suggests finding an average opinion for each grade level. No one understands him, and so, using the chalkboard, he proceeds to explain. An average response for one grade level can be obtained by dividing the grand total by the number of participating children at that grade level.

The class is quite impressed with this idea and breaks up into their five groups. Each group figures the averages for all grade levels for one rule.

The groups spend several days during math time calculating the averages. Because the averages do not turn out to be whole numbers, the class gains further experience with decimals. They again agree to round the decimals to the nearest tenth. As each group completes its computation, they record their answers on a large chart drawn on the board, and some children check other groups' averages.

Rating Averages for Rule Importance

Grade Level	No running Average Response	No fighting Average Response	No marking on walls Average Response	No eating outside lunchroom Average Response	No staying after school Average Response
1	3.0	3.0	3.0	1.0	1.3
2	2.9	3.0	3.0	1.2	1.1
3	2.3	2.9	2.9	1.1	1.1
4	1.7	2.4	2.7	1.1	1.1
5	1.3	2.7	2.1	1.1	1.1
6	1.3	2.2	2.2	1.1	1.1

3 = very important
2 = slightly important
1 = not important

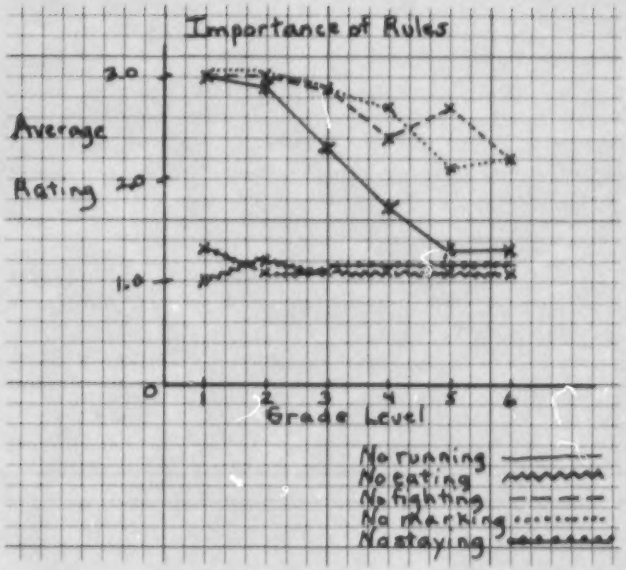


Figure B5-3

Many of the children then volunteer to draw the graph shown in Figure B5-3. The work is accomplished much more quickly this time.

The class discusses the latest graph. Several children with younger brothers and sisters note that the "No running" rule becomes less important as the children get older. They guess that because primary children are so small, they are very conscious of being knocked down should someone run into them in the hallway.

The children then compare the two line charts--the one on knowing rules and the one on importance of rules. The teacher asks the class what they plan to do with this information. Many children feel that they should investigate ways to alter or eliminate the "No eating" and "No staying after school" rules because the children did not know them and did not think they were important. Other children feel the class should see whether children in the school obey the three rules they consider important in maintaining a safe school. The class votes to divide into two groups to work on these two aspects.

Those children interested in altering the two rules quickly agree that the principal is the logical person to see. They decide they need to plan a convincing presentation based on the evidence the class has found. Preparations include writing up a summary outline to bring the principal up-to-date on their activities and making the graphs neater because they will be shown to the principal. The chores are divided among the group members.

Students in the New York class identified five rules that were applicable to everyone in the school. A group was chosen to present their work to the school director and to see if they could get their five rules implemented on a schoolwide basis. (See log by Margaret McD. Cox.)

After a short debate the second group agrees that observing the school population at various places and at certain times of the day will provide them enough evidence of whether children obeyed those three rules they felt were important. The children decide that observation posts should be in places that all grade levels frequent daily and agree on five localities:

1. the lunchroom
2. the front door
3. the back door
4. the hall on the second floor
5. the hall near the library and rest rooms

They also agree on the following times to observe:

1. 8:45 A.M.--the beginning of school as the children enter the building
2. 12:30 P.M.--during lunch hour
3. 2:30 P.M.--the end of school as the children leave the building

The children spend several days making a schedule to be sure each locality and time is covered by an observer. Observation tally sheets are made and several copies are dittoed. The final schedule and observation tally sheet appear as follows:

Time	Lunchroom	Front door	Back door	Hall #1	Hall #2
8:45	Judy	Ray	Jean	Carol	Sue
12:30	Chuck	Jim	Dan	Margie	Ed
2:30	Ethel	Tom	Lois	John	Nancy

Name_____ Time_____ Location_____

1. No running
2. No fighting
3. No marking

The children agree to observe on two days, Monday and Thursday.

The third-grade class in Watertown decided to observe the school hallways in order to determine which rules were violated the most. A chart was made on which the observers could tally their observations. After several weeks of observation, the class noted that the "No running" rule was violated the most. (See log by Marybeth McGrail.)

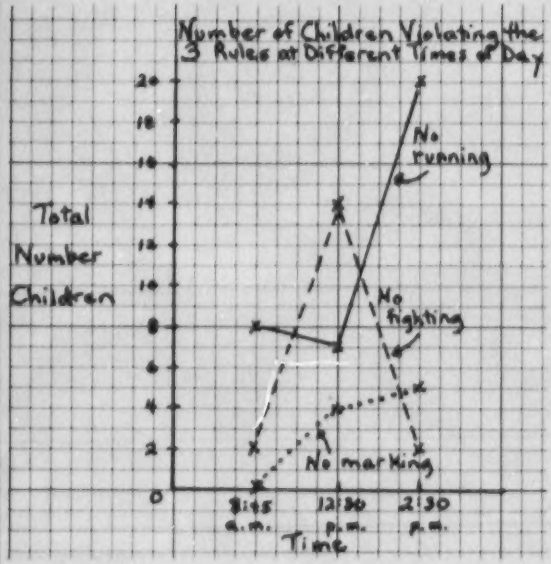


Figure B5-4

In order to determine whether children broke the "No gum chewing" rule fifth/sixth-graders in Lansing, Michigan, conducted a wastebasket survey. The survey consisted of collecting gum and gum wrappers from all of the wastebaskets in the school. In order that no one would know when the collectors were coming, the teacher picked the day and time. Following this survey, the class still felt they did not have enough evidence because many rooms had no gum or wrappers in the baskets. Another survey was conducted in which the respondents were asked outright whether they chewed gum, whether they had been caught, etc. The survey results revealed that most of the children admitted readily to chewing gum despite the rule. (From log by Kathryn McNenly.)

On Friday, the children discuss what occurred during the two days of observation. Several observers remark that many children were curious to know what they were doing. The group spends the afternoon tallying and totalling the data. Their totals for each time and each location appear as follows:

Number of Children Who Violated the Three Rules

Time	No running					No fighting					No marking				
	lunchrm.	fr.door	bk.door	hall 1	hall 2	lunchrm.	fr.door	bk.door	hall 1	hall 2	lunchrm.	fr.door	bk.door	hall 1	hall 2
8:45	0	3	4	1	0	0	2	0	0	0	0	0	0	0	0
12:30	5	0	0	2	0	2	0	1	7	4	2	0	0	2	0
2:30	0	2	1	9	8	0	1	0	0	1	0	0	0	2	3

The children then decide to find the total violations of each rule for each time period, reasoning that this is the best way to compare violations of the different rules and still be able to identify the times when most violations occurred. Two children then draw the graph of the data shown in Figure B5-4.

Analyzing the data and the graph, the children note the following:

1. Violation of the "No Running" rule occurred mostly at the end of the school day.

2. Violation of the "No Fighting" rule occurred mostly during the lunch period.
3. There were few violations of the "No Marking" rule.

In checking their data for locations of violations they find that both the running at the end of the day and the fighting occurred mostly in the halls.

During the class discussion the two groups (rule changes and observations) share their findings. The first group explains the principal's position on rules modification. Agreeing that the group had convincing evidence that the "No Eating" and "No Staying" rules were not too important, the principal agreed to allow the student council to investigate ways to modify these rules and to submit their ideas to her. She stated that should the student council handle this issue responsibly and effectively, she would allow it to deal with more school issues relating to the student body.

The observing group present their graph and share their conclusions. The class discusses ways to remedy the situation during these two times. The idea of posting safety patrols in the halls before lunch and at the end of school is quickly vetoed for two reasons:

1. No one wants to give up his/her lunch time or be delayed in leaving school.
2. Everyone feels that the school would be like a prison with patrols spying on you.

The class agrees on the following solutions:

1. A few minutes before school lets out, remind the children not to run. The public address system would be used.
2. Put signs up in the halls to remind children not to push and shove (causing fights).

The third graders from Watertown made posters and school rules handbooks to remind the children what the rules were. The posters were hung throughout the school; the handbooks were put in the school library for children to check out and use. The children also made colorful necklaces and campaign buttons with the letters O.T.S.R. (Obey The School Rules) on them. These were made from Tri-Wall and

yarn and attracted much attention from the other children. (See log by Marybeth McGrail.)

The two solutions are put into effect. It becomes clear at the end of the week, after the novelty has worn off, that the children resume their old habits. The class notes this and decides to find other ways to replace the public address system and posters. In the ensuing months the class works on a Mass Communications challenge of finding good ways to remind the school population about the school rules, particularly the three that were identified as being important.

6. QUESTIONS TO STIMULATE FURTHER INVESTIGATIONS AND ANALYSIS

- What are the school rules?
- How many children do you think know what the school rules are?
- How do you feel about the school rules?
- How do you think other students, the principal, teachers, and school personnel feel about the rules? How can we find out?
- How many people should we ask? How do we pick these people?
- How can we find out if our questions are easily understood? How can we find out if answers to our questions will give us the data we want?
- What is a good way to make a picture of our data?
- What does our data tell us?
- Who makes the school rules?
- Which rules are most important in maintaining a safe school?
- Which rules need revising? What new rules are needed?

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- How do we go about seeking additions and/or revisions of the school rules?
- How can we inform the rest of the school on what the rules are?
- How can we encourage everyone to obey the rules?
- What is a fair penalty?
- What has occurred in the school since we implemented our campaign to obey the school rules? How much change has there been?
- How have these changes made a difference? How can we find out?
- What revisions need to be made to our campaign on rules?
- How can we compare how children in the different grades feel about the rules?

C. Documentation

1. LOG ON SCHOOL RULES

by Marybeth McGrail*
Hosmer School, Grade 3
Watertown, Massachusetts
(November 1974-April 1975)

ABSTRACT

Being in a team teaching situation, this third-grade teacher worked with half of the class (twenty-two students) on USMES. Working approximately two and one-half times per week, the class first examined classroom rules. The children conducted a survey among the various grade levels to determine classroom rules. For school rules, the children compiled a long list of rules which they felt would make the school safe. The list consisted of safety rules, rules that prohibited the destruction of school property and two rules stressed by the principal, no pets in the classroom, and no wearing hats in the school building. Several children disagreed with the principal's rules and wrote letters to him stating their reasons for disagreement. The principal later came to the class to explain his reasons for the rules. To remind students to obey the school rules, posters, wall plaques, and campaign buttons were made and hung in the hallways. Handbooks were also made to inform the other students what the school rules were. These books were placed in the school library for students to check out. After the posters had been hung in the halls for several weeks, the class noted that many were either torn or written on. These incidents prompted the class to monitor the halls to determine which rules were violated the most and to put up additional posters.

During the months of September and October we discussed and looked at rules in our classroom as well as in other classes. We also discussed reasons for rules and considered fair penalties for violating the rules. The children made a list of all our class rules. Later they made a survey to determine what the classroom rules were in other grade levels. Their survey consisted of the following four questions:

*Edited by USMES staff

1. Does your class have any rules?
2. Who makes the rules, students or the teacher?
3. What are the rules?
4. Why do you need these rules?

The children surveyed one class in each grade level from kindergarten through sixth. The rules for each grade level were recorded on the board. The children noted that some rules were identical in all the grades, such as no shouting, no running, no gum chewing, and no fighting. They also noted one rule that differed between primary and intermediate grades. The older children were permitted to leave the room, one at a time, by just signing out, while the younger children had to seek permission.

In November, we expanded our investigations of rules to school rules. During the initial discussion it was evident that the children were unsure of what the school rules were. However, they surmised that many of the school rules, like many classroom rules, were common sense safety rules. For example, they agreed that the classroom and the school would be safer if children did not run, yell, or fight. The class decided to make a list of rules that they felt would make the school safe. In order for the rule to be included on the list, a good reason for its necessity had to be provided. The class listed twenty-one rules, including two of the principal's (no hats and no pets). The class voted on which rules they felt were very important and placed a star beside each one. All rules on the list were voted as being important except one, "no clogging bathroom toilets."

1. No running in corridors*
2. No clogging up bathroom toilets
3. No writing on bathroom doors*
4. No pets in the classroom*
5. No stickers on lockers*
6. No throwing things around*
7. No sticking out tongue*
8. Don't clap erasers against building*
9. No swearing*
10. No fighting*
11. No stealing*
12. No tripping*
13. No clowning*
14. No jackknives*
15. Obey fire drill rules*

Dear Mr. Harris,
I don't see why you can't wear hats in school. My friend Ann-Jameson has one of her favorite hats and ever since you had that rule my friend hasn't had a chance to wear it to school. I don't mean the apes like the boston Bruins hats. I mean the hats like the beach hats. Thats the kind my friend has. A lot of people in my classroom would like to wear hats in school. I bet a lot of other classes would like to wear hats in school. I would like to wear hats in school too. Maybe some other classes don't want to wear hats in school but I sure would.

Monique Bagosian

Figure C1-1

Dear Mr. Harris
I would Like Pets To be able To come To School because if you realy like your Pet You would like To show your class and you Could ask your MoTher Todrive you Toschool with your pet and show it To your friends Then she can bring your pet home but your right Tha There shouldn't aT Least youcan do what I said but it's your School so I Think Their Should be pets So if you Think There shouldn't Then There shouldn't be no pets
Sighned
Mike DAmico

Figure C1-2

16. No chewing gum*
17. No breaking anything*
18. No throwing snowballs*
19. Don't wear hats*
20. Care for your stars and stripes friend*
21. Respect for others*

The principal's two rules (no hats and no pets) created some discussion. Many children could not understand why pets, especially small ones, such as turtles, fish, or gerbils, could not be in the classroom since they were not disruptive. Similarly, several children could not understand why hats had to be taken off in the school building. We talked about providing good reasons against these rules since the principal had mentioned to me that he would seriously consider altering rules if the children could provide sound arguments for change. The dissenting children agreed that they would think of reasons and write letters to the principal.

We talked about what to do with the list of school rules. There was a quick consensus to inform the rest of the school what these rules were. Posters were suggested as well as rules handbooks. The children felt that the handbooks could be placed in the school library for children to check out.

The class divided into three groups to make posters, to write letters to the principal about his two rules, and to make school rules handbooks. The groups worked simultaneously. Children moved to new groups when they had completed work in their old groups. Periodically, we had class discussions to share what each group was doing. This log documents the activities of each group, one at a time.

The six children who strongly disagreed with the principal's two rules spent several weeks composing and writing letters. Individual letters were written. Three children wrote letters regarding the "no pets" rule; the other three children wrote their letters on the "no hats" rule. Figures C1-1 and C1-2 show two children's letters. Because the letters were going to the principal the children made a real effort to write clearly, spell correctly, and employ proper grammar. After several drafts the final letters were sent.

Several weeks later the principal dropped by the room to acknowledge receipt of the letters. He informed the class that he understood their concern but carefully explained his reasons for the two rules. He felt that both animals and children would be healthier if the animals were kept only in the science room where a few animals were presently

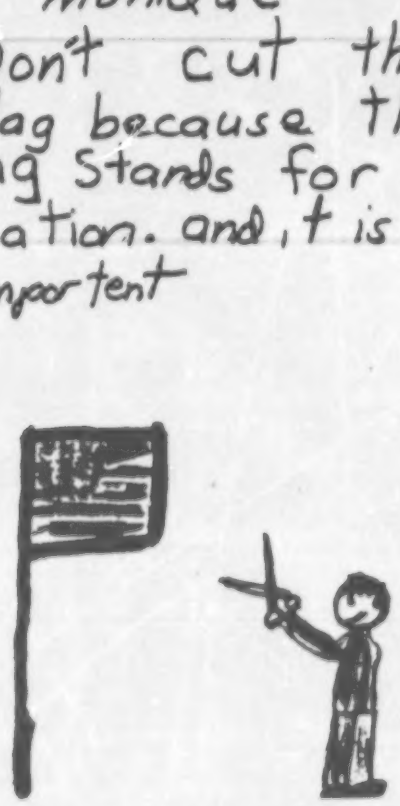

Figure C1-3

kept. He also felt that under these controlled conditions, any animals that escaped would be restricted to only one part of the school. He then explained his reasons for the "no wearing hats in the school building" rule. He confessed to the class that he was a bit old-fashioned and strongly felt that it was disrespectful for children to wear hats in a public building. The children listened attentively as the principal spoke. They were quite satisfied with his reasons, and after he left, they voted to retain the two rules as important school rules.

Many children were eager to make the school rules handbooks. We discussed what should be included in the books. The children agreed that it would be too big a task to include all twenty-one rules that the class had listed. They decided that eight rules per book would be adequate; each child making a book was to pick the eight rules he/she wanted in his/her book. Because I expressed a preference for the rule, "Respect for others," the children decided to include this rule in all the handbooks.

The children spent several months preparing the handbooks. They were particularly anxious to do a good job because they realized that other children would be examining them. Rough drafts were first written and carefully scrutinized for correct spelling and grammar and proper sentences. On the final copy, rulers were used to draw straight lines to insure straight letters. After a rule was written, each child drew a picture to illustrate the rule.

Each child thought of his own reasons for the rules that he chose to include in his book. Below are some of the children's rules and reasons.

> No running in the corridors--"because if you run and you go around the corner and someone else is coming and you don't know, you might bump and get hurt."
>
> No stickers on the lockers--"because if you put a sticker on your locker and you leave it there for a month or two, then when you take it off the lockers will be all black."
>
> No writing on bathroom doors--"because if some big kid comes along and writes a swear and then a little kid comes along and starts saying it around other people and does not even know what it means, he could get in trouble although it was the big kid's fault."

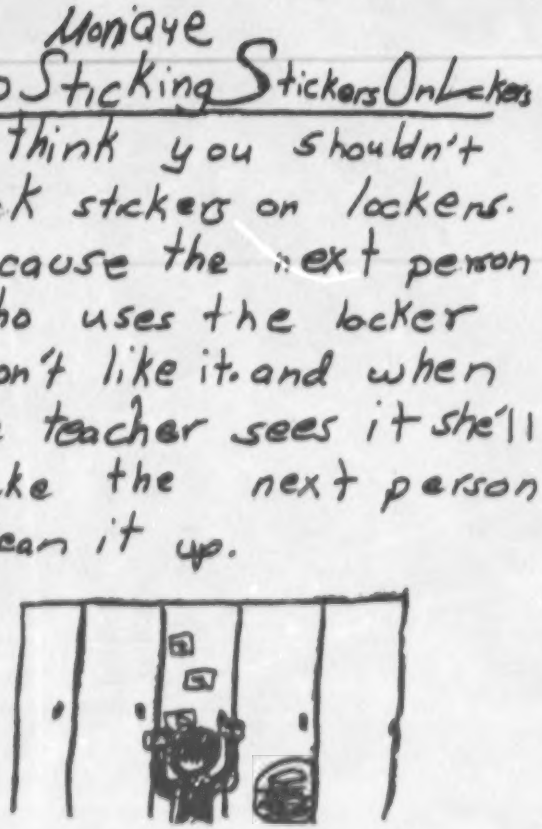
Moniqye
No Sticking Stickers On Lockers
I think you shouldn't stick stickers on lockers. because the next person who uses the locker won't like it. and when the teacher sees it she'll make the next person clean it up.

Figure C1-4

When the handbooks were written, the children made covers for them. Figures C1-3 and C1-4 show two pages from one girl's handbook. The finished products were placed in the school library on a table which the librarian specially placed near the library door.

Several children, especially those with younger brothers and sisters, chose to read their handbooks to another class, before placing them in the library. The children made appointments with the classroom teacher. They obtained great pleasure in their reading of the handbooks. Several months later the librarian informed the children that the handbooks were the most popular books; every handbook had been checked out. The class was very pleased.

The children interested in making posters discussed various ideas of what to put on the posters. Most of the children decided to illustrate either a rule being violated or the consequences of violating a rule. They spent several weeks coloring and carefully printing the rule at the top. Figure C1-5 shows one child's poster.

When several posters were completed, the children discussed where to hang them. Several children felt that posters should be hung in places where rules were violated the most, for example, in the bathrooms and hallways and near the drinking fountain. Other children wanted to hang the posters where friends could easily see them, for example, near the various classrooms. A few children felt that the posters should be hung in places where all classes went frequently, such as the auditorium, library, lunchroom, and hallways. After considerable debate, the group agreed to hang them in common places such as the hallways, lunchroom, and bathrooms. Before the posters were hung, permission was sought from the principal, who gave them his okay.

As the posters were completed, several children became interested in working with the materials in the Design Lab. These children made pendants and campaign buttons to encourage children to obey the school rules. Figure C1-6 shows several children's designs. The children also made plaques for other classrooms. On the plaque was written one rule the class voted as being important.

After the posters had been up for several weeks, the children noted that some had been written on and others had been torn down.* The children were naturally quite distressed, and we debated what our alternatives were. Some

*The children might investigate whether posters or plaques survived for a longer time.--ED.

NO STICKERS ON
LOCKERS! !!!

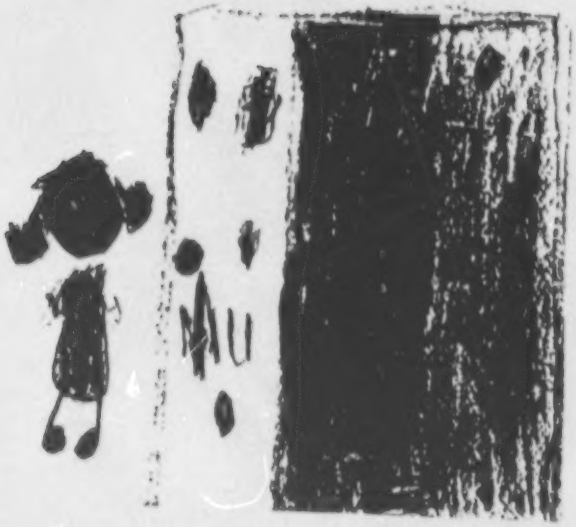

Figure C1-5

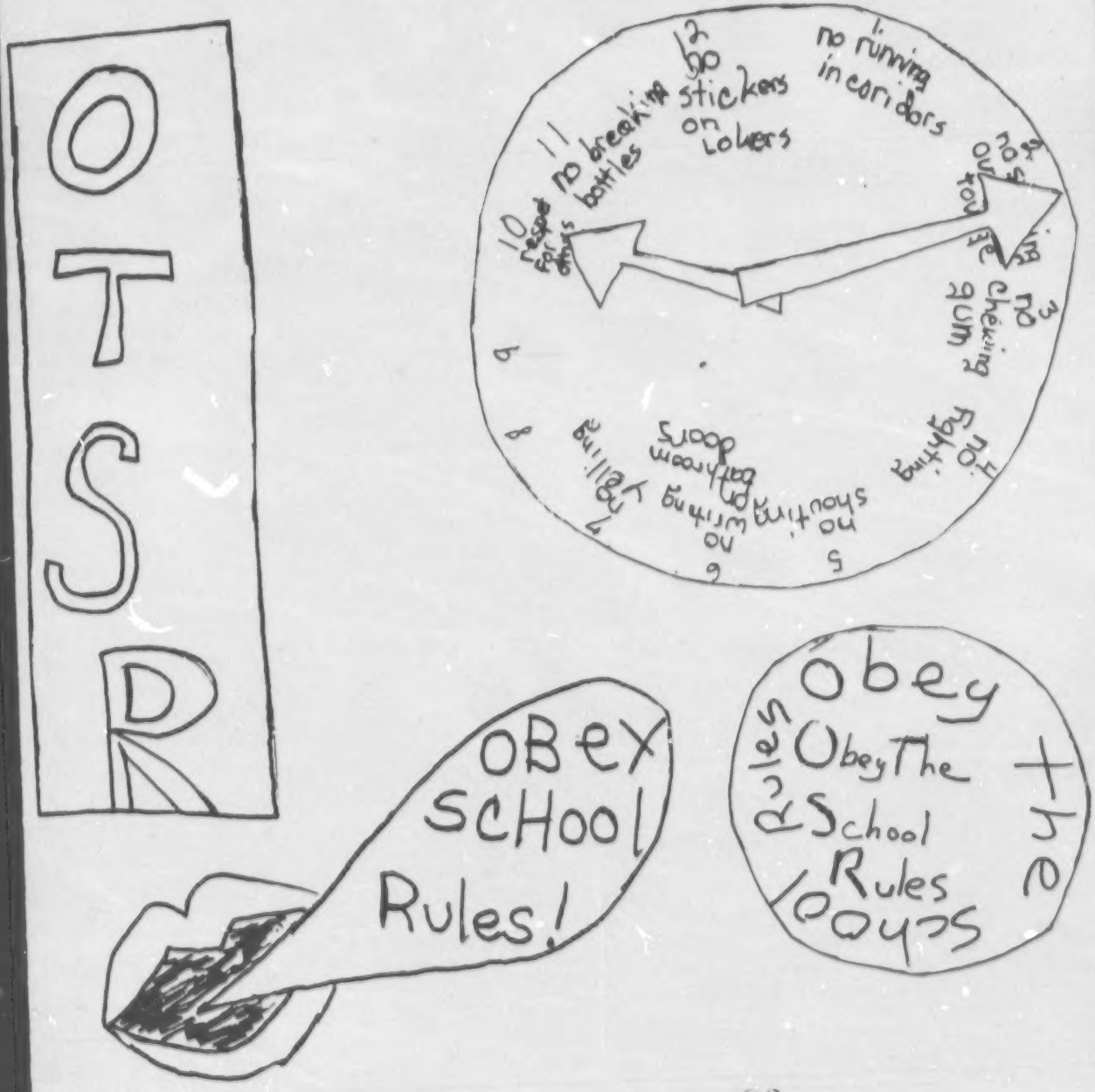
OTSR
1 no running in corridors
2 no stickers on lockers
11 no breaking bottles
3 no chewing gum
5 no shouting
6 no writing on bathroom doors
7 no yelling
Obey the Rules
Obey School Rules!

Figure C1-6

children wanted to take the remaining posters down. One child suggested having the principal make an announcement over the P.A. system asking for the other children's cooperation. Another suggestion, which brought a lot of laughter, was to hang additional posters saying, "No tearing posters down." After considerable discussion the class agreed to hang the posters higher so that they were less accessible.

The above discussion brought to the fore the problem of how to catch violators and appropriately punish them. Most of the children agreed that violators should be detained after school in our room. However, the problem of catching a violator raised questions in many children's minds. The real problem of dealing with older children seemed unsolvable. The children agreed that the older children would not reveal their names and probably would even make fun of them. After much discussion we decided that we really were not interested in who violated a rule but rather in what rule was violated.

To observe what rules were violated the most, the class decided to monitor the halls and agreed that the hallways on all three floors should be monitored. Several children wanted also to monitor the school library.

The children designed a chart form on which to record their data. All twenty-one rules were listed on the left side of the chart. Additional space was left at the bottom for children to write in additional misbehavior. To the right of each rule was space for the observer to check the rule if he saw it being violated. Because we agreed that it would be equally interesting to note all those children who obeyed the school rules, we decided to use checks (✓) to stand for violators and stars (*) to represent those who obeyed the rules. The children's chart looked like the one shown below.

Rules				
no running in corridors				
no clogging up bathroom toilets				
no writing on bathroom doors				
no pets in classroom				
no stickers on lockers				
no throwing things around				
(remaining fifteen rules)				

Each observer made his own chart using the above format. To record the accumulated data, two girls made one large chart on the board.

The class agreed that one fifteen-minute observation period per observer was sufficient time to gather data but not so long as to be too tiresome. After the fifteen-minute period, each observer was relieved by another child until the children decided to stop observing for the day. The observation schedule for the first day was made and appeared as follows:

Library	Basement	First Floor	Second Floor
Greg	Linda	Julie	Jamie
Jimmy	Beth	Rosena	Joey
Mark	Monique	Scott	Kimberly
Michael	Madlene		Jeffery

Because several children were out of the room for special classes on the first observation day, these fifteen children began observing the hallways and the library in the morning. These observations yielded the following results.*

Rule	No. of Violators
Ran in hallways	35
Made funny noises	1
Fooled in hallways	5
Yelled in halls	5
Whistled in halls	3
Sliding feet on hall floors	5
Jumping in halls	3
Slammed lockers	3

During the ensuing month the children did not set up a formal schedule. Rather, they observed only after they had completed their work and felt like monitoring. During these several weeks most of the observations occurred in the afternoon after lunch. After one month of observing, the total

*The children might discuss the results of their observations on the first day not only in terms of the rules most frequently violated but also in terms of when these violations occurred. They might also draw bar graphs of both types of information. Future observations might be made only at critical times.--ED.

results appeared as follows:*

Rule	No. of Violators
Ran in corridors	105
Fought in hallways	5
Stickers on lockers	2
Yelled in halls	36
Whistled in halls	6
Slid feet on hall floors	31
Jumped in halls	5
Slammed lockers	16
Was noisy in halls	6

Based on their observation data, the children decided to make additional posters to remind children to obey those rules which they had found to be disobeyed most. Their posters included rules on the following:

No running
No yelling in the halls
No sliding feet on hall floors
No slamming locker doors

In the late spring the principal came into our room to remind the children to close their locker doors. The children decided immediately to make posters to put above the lockers reminding students to close the doors.

*The children might discuss the categories of the violators, perhaps combining several. They might also discuss how this combination of categories affects which rules are violated the most.--ED.

2. LOG ON SCHOOL RULES

by Margaret McD. Cox*
United Nations International School,
Grade 3
New York, New York
(September 1975-May 1976)

ABSTRACT

The School Rules challenge evolved in this third-grade class from a discussion of possible rules for their classroom. Several of the rules suggested were noted as being applicable to the whole school. The students decided that probably not everyone was familiar with the school rules, if there were any, and decided that their challenge was to determine what the school rules were and to see if they could change some or add new ones. The children obtained the rules for each house. They also learned from the director of the school that there were no overall school rules written down for students. The class decided that they could compile their own set of rules from the information that they had gathered. The children identified eight possible rules but reduced this number to five after a school survey. The children reasoned that the fewer rules there were the more there would be a tendency to remember and obey them. Because four of the rules began with the word "no," they were reworded to sound less negative. The five rules were then submitted to the faculty and principals for comments and criticism. Based on faculty suggestions, the rules were combined and reworded. A small group was then selected to make a presentation to the director of the school. Because it was close to the end of the school year, the director promised to submit their idea to the school faculty at the beginning of the next year.

We began the school year investigating classroom rules before working on a School Rules challenge. The children readily saw a need for classroom rules after spending the first day without them. Interest soon expanded to what the rules were in other classes and grade levels. The children decided to survey one class per grade level in the Junior House. (Our school is divided into three houses: the Junior House includes grades K-5, the Middle House includes grades 6-8, and the Tutorial House includes grades 9-12.) Four questions were included in the survey:

*Edited by USMES staff

1. What kind of rules do you have in your classroom?
2. What kind of lunchtime rules do you have?
3. What kind of line-up system do you have?
4. What kind of rules do you have for using different parts of the classroom?

Based on their survey findings the children made the following observations of rules in other grade levels:

1. Rules for the younger children were different from those of the older children.
2. Because each classroom's mode of operation was different, some classes had rules that were not pertinent to others.
3. Many students were unfamiliar with their classroom rules.
4. There were some rules that were common to all classes.

As a result of their classroom rules investigations they decided to develop a set of rules for our room.

Our School Rules challenge evolved during a discussion of possible classroom rules. As the children named possible rules for our class, I deliberately listed those suggestions that were applicable for the entire school on the opposite side of the board. Eventually I was questioned by several children as to why I had separated these rules from the main list. One child pointed out the fact that these rules pertained to everybody in the school and not just to our class. Some of these school rules included the following:

1. Get to school on time
2. Eat lunch on time
3. No throwing things
4. No pushing to get classroom materials

I asked the children if they thought everybody in the school knew all the school rules. There were answers in both the affirmative and the negative. One girl suggested immediately that we find out about the rules and post them around the school. I then asked the class if they would be interested in pursuing this girl's suggestion. Everyone agreed and we stated our challenge: "Find out what rules we have in the school. See if we can change some or add new ones."

While the rest of the class finished the activities per-

taining to classroom rules, one group of six began immediately to work on the School Rules challenge. After some intragroup squabbling, I intervened and focused their attention on the task at hand. I asked them how they could find out what the rules of the school were. One child suggested that we could obtain this information from the principal of the Junior House, and another suggested seeing the overall director of the school. The group decided to follow both suggestions. Four children went to the principal's office, and two children went to the director's office.

The children who went to the principal's office were unable to meet with him, and so they made arrangements with his secretary to return. The other two children were unable to meet with the director, but his secretary sent them to the principal of the Tutorial House. As this principal was also unavailable, his secretary allowed the children to talk to two students from the Tutorial House who happened to be in the office. They were also given the Tutorial House rules which we discussed later in class. From this list of rules the children identified those that really did not apply to the whole school, but only to the older children (e.g., No smoking). Later the rules of the Middle House were also obtained and discussed.

Several weeks later the four children were able to meet with the Junior House principal. From their meeting they obtained eight rules pertaining to their house which they then shared with the class:

1. Follow directions
2. No chewing gum
3. No running on stairs or in corridors
4. No running in chains on the playground
5. No toy guns
6. No kicking on the monkey bars
7. Stay to the right of the stairs
8. Be quiet when you come to assembly

In discussing these rules the children found that many in the class did not know them. We hypothesized that quite a number of other children in the House also did not know them. We then decided to find out how many children did, in fact, know the rules.

The focus of the discussion turned to ways to obtain our information. One suggestion was to divide into small groups, each group interviewing one or more classes. Within a given class the old and new students could be interviewed separately. Another student suggested asking the teacher in

each class to identify one child who was familiar enough with his classmates to know whether they knew the House rules, but this idea was quickly vetoed because everyone felt that each student should be asked.

At this point in the discussion I asked the children what was the total number of classes in the Junior House. From the number of classes per grade level we reached a grand total of twenty-three classes. One girl commented immediately that if there were twenty-three classes and twenty-three children in our class, each child would have to interview one class. I reminded everyone that there had been several in the class who had not wanted to interview alone. Someone then suggested that perhaps some children could interview in groups and others alone.

We then considered the amount of time this interviewing would take. We talked about the fact that the classroom rules interviews had taken three weeks and only six classes were involved. One child said that some children did not work efficiently within their groups. Part of this was due to intragroup disagreements and to the fact that some children were afraid to talk in front of another class. Others said that their biggest problem was finding a time suitable for both their group and the class to be interviewed.

The class finally decided that it would be impractical to visit all twenty-three classes. They again decided to visit one class per grade level in the House. To choose one class per grade level, the children placed all the teachers' names for a grade level in a container. One name was drawn. This procedure was repeated for each level for a total of six classes.

Once they had determined the classes to be interviewed, I asked the class to think of a good way to arrange convenient times for their interviews. The children decided to put a note in each teacher's mail box and to have the teacher reply. (Because someone used the abbreviation, R.S.V.P., we discussed both the English and the French meaning.) Together we composed the following note:

> *Junior (House) 3, Miss Cox's class would like to do a survey in your class to see how many children know the Junior House rules. We would like to know when you would be free. R.S.V.P.*

To simplify organizational procedures, someone suggested that they remain in the same small groups that had been formed for the previous interview, but the class voted to

Dear D.r. Bruce,

J3Cox is making a survey about School Rules We are trying to find out if ther are any School Rules that apply too the whole school. Can you help us? Do you have a book of school rules? Or could you visit our class and talk to us about them

Your frends J3 cox

R.S.V.P.

Figure C2-2

Dear J 3 Cox,

I am sorry that your nice letter of 5 November arrived after I was gone from school for a two week business trip.

There are some school rules and most are listed in the Parents' Handbook. We do not have such a book for the boys and girls.

I am glad you are working on such a project. Perhaps we can use your project for other classes.

Thank you for your help!

John Bruce

Figure C2-3

change. Before the class broke to form new groups, I cautioned them to make sure that there was at least one person in each group who was not afraid to talk in front of a new class.

During the next several weeks the groups interviewed their classes. Each group wrote the eight house rules on a large sheet of construction paper. To the right of each rule were two columns labeled "know the rule" and "don't know the rule." During the interview each rule was read to the class, and the number of children who did or did not know that rule was recorded.

The students then made bar graphs of their data and ordered all of the completed graphs according to grade level. Figure C2-1 shows one group's data collection sheet and their bar graph. (Unfortunately the surveys of the Junior A and Junior 3 classes were lost, much to the distress of the involved group members.)

The students noted that the younger children (Junior 1 and Junior 2) knew more of the rules than the older children. One boy suggested that perhaps the teachers in these grade levels repeated the rules more often to remind their children and that teachers in the upper grades assumed that the older children had better memories and did not need frequent reminders.

Because the class was not successful in arranging a convenient time to meet with the director of the school, they picked two students to write a letter to him asking whether there were any rules that pertained to the whole school. Figure C2-2 shows the letter that the class composed and sent.

Several weeks later the class received a reply (Figure C2-3) stating that there were overall rules for the school and that they were listed in a parent's handbook. The director also stated that there was no such handbook for students.

Together we went over the rules in the handbook for parents. The students identified the rules that pertained to the whole student body, such as "Students cannot leave school early without written permission." They felt that other rules were more relevant to parents or to specific grade levels, such as "Mail all party invitations."

I asked the class whether, in view of the fact that there were no school rules written down for students, did they still feel rules were necessary. They replied that they did and decided that, with the information they had collected on the rules in the different houses, they could compile their own set of school rules.

	Know about	Do not
1. Follow directions.	20	4
2. No chewing gum	24	0
3. No running on the stairs, corridor	24	0
4. No running in chains on the playground	2	22
5. No toy guns	20	4
6. No kicking on the monkey bar	13	11
7. Stay to the right of the stairs	20	4
8. Be quiet when you come to assembly	24	0

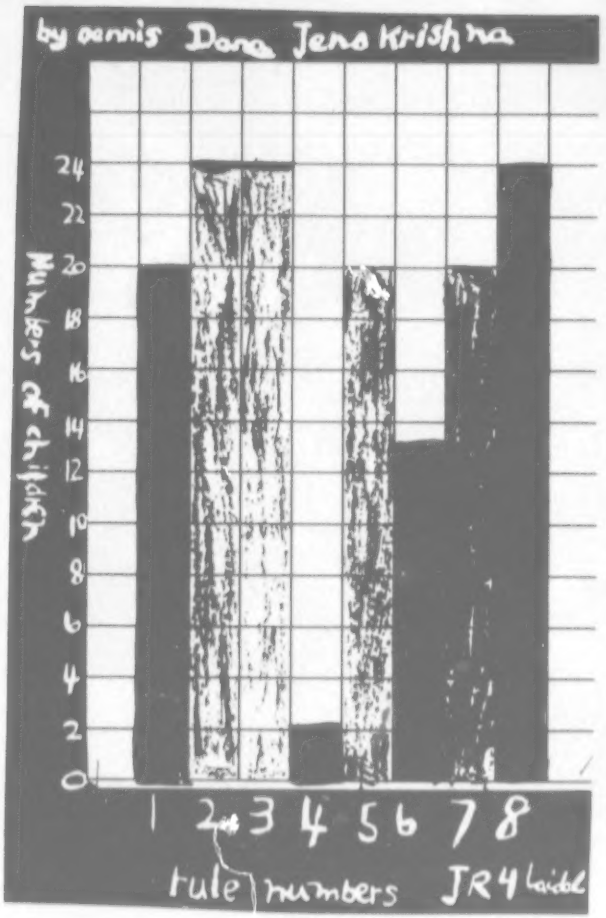

Figure C2-1

The class proceeded to go through the lists that they had collected previously from the Tutorial, Middle, and Junior Houses. There was much interesting discussion as to why they felt certain rules should or should not be considered a school rule. They agreed that the Tutorial House rule, "No chewing gum or eating in the halls," was a good school rule because, as one boy pointed out, gum ruined clothes and school books. They also agreed that "No unnecessary screaming" was a good school rule. For a while they debated the rule "No cutting classes" and finally decided that it did not apply because cutting school was not an easy thing to do.

When all the lists of rules had been examined, the class identified the following eight rules that they thought were applicable to the whole school:

1. No leaving school early without permission
2. No chewing gum or eating in the halls
3. Be considerate of others
4. All food must be eaten in the cafeteria
5. No hardballs
6. No toy guns
7. No leaning out of windows
8. No running on stairway or in halls

A week later the class decided that eight rules were too many. The general feeling was that there would be more of a tendency to obey rules if there were only a few and that fewer rules would also be easier to remember. They agreed arbitrarily that five rules was a good number, but because they felt that all the rules were good, they did not know which ones to eliminate. I took this opportunity to remind them that they were but a small fraction of the school and that if they wanted these rules to apply schoolwide, they might want to do something about getting other opinions. The class agreed and decided to do a schoolwide survey asking students to state their preference for five of the eight rules.*

Because this survey would involve quite a few more people than they had previously surveyed, I introduced the idea of a random sampling. The children then organized themselves into three groups, one group for each of the three houses.

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*The students might consider whether a survey on preferences for rules would give the same results as a survey to determine which rules students felt were necessary.--ED.

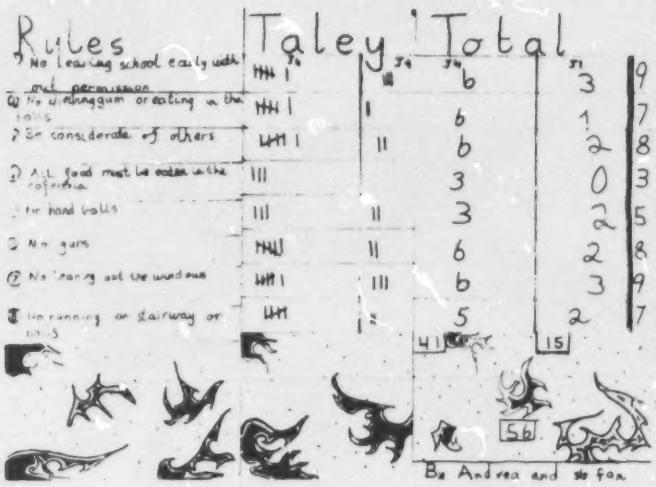
Rules
Taley
Total
1) No leaving school early with out permission
2) No chewinggum or eating in the halls
3) Be considerate of others
4) ALL food must be eaten in the cafeteria
5) No hard balls
6) No guns
7) No leaving out the window
8) No running on stairway or halls
41
15
56
By Andrea and Stefan

Figure C2-4

At this point I left each group entirely alone to make their decisions as to how they were going to conduct their survey, how they would set up the survey, and how many people they would survey. All of the groups worked exceptionally well resolving any differences without any interference from me.

Within each group the members paired off. Each pair then made up its own data collection sheet, which consisted of a sheet of construction paper with the eight rules written on it. To the right of the rules there were two columns, the first column for tallies and the second one for the totals. Figure C2-4 shows two children's data collection sheets.

The group responsible for administering the survey in the Junior House decided to sample one class at each of the levels so that they would get an age range. The children felt comfortable giving the survey because they knew the classes and the teachers.

The groups responsible for the two upper houses, however, were totally unfamiliar with the students and faculty. Consequently, they surveyed any class that was able to take their survey at the time. In some cases teachers were included in the sampling because the children did not know teachers from students. Before Christmas vacation the three groups surveyed about sixty students in each house.

After vacation we evaluated our progress with the school-wide survey. The group responsible for the Tutorial House had interviewed two groups of fifteen and one group of twenty, or fifty students. The Middle House group had interviewed thirty-eight children.

Totalling the numbers, we discussed whether these 163 students represented an adequate number of opinions. At one boy's suggestion we voted on whether it was necessary to interview more people. The majority felt that we needed more opinions.

As the amount of time available for our USMES activities was limited, I asked the children to take this factor into account when deciding on the total number of student opinions they felt would be a representative sample. Four totals were given as being good sample sizes--150, 200, 250, 600. The 150 total was eliminated when someone noted that they already exceeded this amount. The 600 total was decreased to 350 after one girl noted that this amount was too unrealistic for the amount of available time. The class then voted to use a sample of 250 students.

We then did a calculation on the board. We subtracted the number of children already surveyed (163) from the total number of children they wished to survey (250) to determine

the number of children we had yet to survey (87). We then divided this amount by three (three groups) and determined that each group needed to survey 29 more people. This task was accomplished during the next several days.

When all the surveys had been completed, we gathered together to share our results. We discussed the best way to record all the data and drew a chart form on the chalkboard with subtotals placed to the right of each rule. Various students then added the subtotals and placed the final total in the far right column.

Rules	Totals	Full total
1. No leaving school early without permission	9, 12, 8, 18, 17, 3, 1, 5, 7, 7	87
2. No chewing gum or eating in the halls	3, 6, 10, 7, 16, 4, 4, 7, 2, 5	64
3. Be considerate of others	11, 27, 18, 17, 14, 18, 20, 8, 2, 8	143
4. All food must be eaten in the cafeteria	3, 9, 5, 7, 8, 4, 7, 1, 5, 3	52
5. No hardballs	10, 16, 10, 5, 3, 8, 3, 5, 7	67
6. No toy guns	18, 19, 7, 5, 18, 16, 2, 17, 11, 15	129
7. No leaning out of the window	11, 6, 19, 9, 19, 14, 2, 14, 17, 14	115
8. No running on stairway or halls	(unavailable)	60

With one rule (6. "No toy guns") we ran into a problem. The children were surprised that the total was so high because the rule was not one that they had thought would be popular.

Because my attention was diverted during the time the class was working on the total for this rule, I told them to continue totalling the other rules while I tried to figure what had happened. Fortunately, our USMES observer saw what had occurred and whispered quietly to me that the child who was recording the totals had accidentally placed a number in the tens column rather than the ones column.

When the children returned from the library, I explained what had happened and took the opportunity to give a lesson on place value. The children were very interested and we concluded it by reading the revised (and somewhat lower) total for the sixth rule.

The five most popular rules were as follows:*

*The students might discuss whether the wording of a question was responsible for the results.--ED.

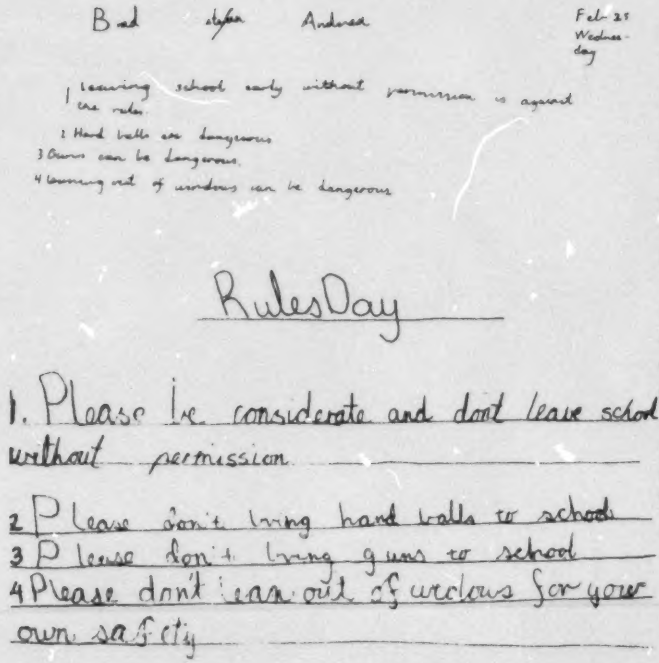
Brad Styles Andrea
Feb 25 Wednesday
1 leaving school early without permission is against the rules
2 Hard balls are dangerous
3 Guns can be dangerous
4 leaning out of windows can be dangerous
Rules Day
1. Please be considerate and don't leave school without permission
2 Please don't bring hard balls to school
3 Please don't bring guns to school
4 Please don't lean out of windows for your own safety

Figure C2-5

1. No leaving school without permission
2. No leaning out of windows
3. Be considerate of others
4. No guns allowed
5. No hardballs in school

Several weeks later we examined our list of five rules. I asked the children to look particularly at four of the rules to see whether they noticed anything about the wording. One child immediately stated that they all began with the word "no." Another child commented that "no" sounded too severe and suggested that perhaps we could reword them so that they would not sound so negative. Agreeing to this idea, the class split into small groups to reword the four rules.

The children worked with great enthusiasm on this rewording task. As I walked among the groups, I heard their discussing the merits and negative aspects of suggested rewordings. They consulted the dictionary frequently. Figure C2-5 shows the work of two groups.

Comparing the groups' work, we noticed that several of the rewordings were similar. We recorded on the board all the different wordings for each rule and voted to select the best wording for each rule. The following are the rules in their new form:

1. Please be considerate and do not leave school without permission
2. Be considerate of others
3. Please do not bring hardballs to school for your own safety
4. Guns can be dangerous
5. Please do not lean out of windows for your own safety

Satisfied with their rules the class next discussed what they wanted to do with them. The children felt it would be important to determine how teachers and principals felt about their rules and to get ideas from these people on how the rules could be implemented. After breaking into small groups to think of ways to get in touch with and interview teachers and principals, the children came up with the following ideas to accomplish their aims:

1. Write letters to the teachers
2. Make appointments to talk to the principals

3. Talk to the principals
4. Ask the principals to discuss their rules with teachers

As we talked about what should be included in the letter, one girl suggested that we include an explanation of what our class had been doing and how we had arrived at these five school rules. The discussion generated four pieces of information that should be in the letter:

1. Who we are
2. What we have done
3. What we would like to do
4. What we would like them to do

At first all the children wanted to try writing separate letters, but they then realized the great amount of time it would take to read and choose one letter from twenty-four different letters. Therefore, they decided to break into three groups, agreeing that one letter out of three would be a much easier choice. I agreed with their decision and further suggested that one person be responsible for writing while the seven other members be responsible for the thinking.

The following session the children went immediately to their groups to work on their letters, a task they soon found to be very difficult. There was much disagreement among themselves as to the order of past events and whether some of the suggested activities were actually carried out. Arguments also evolved over work preferences. (Later I noticed that this problem was resolved by the members voting on every idea before it was included in the letter.)

After several agonizing weeks the children began to balk at getting into their letter-writing groups. The task of recalling events that had occurred eight months ago, placing the events in logical sequence, summarizing main ideas, and so forth, obviously required skills that even older students would find challenging. I decided to call the whole class together to discuss their difficulties.

I asked them if they knew why the groups were having trouble working on the letters and why they were not accomplishing much. The children immediately picked on the more difficult children in their groups, claiming that they were acting silly and being disruptive. I did not comment on these statements but rather focused their attention on the task of compiling and writing a letter. A unanimous chorus

of "yes" was heard when I asked whether they found letter-writing hard. I suggested that perhaps we could compile the letter together, and they immediately agreed.

During the week that we were writing the letter, I received a questionnaire. I thought that perhaps a questionnaire might be a useful tool for the class, and so I showed them mine. Although unfamiliar with what it was called, many knew the purpose of the questionnaire. (One child said, "It's a way to find out about things from people.") I asked them if they thought it might be a useful way for them to find out how the other teachers felt about their rules. They were very interested in the questionnaire idea and decided to try it out.

We then worked as a whole class to formulate the questionnaire. They gave ideas and I listed them on the board. One child was then chosen (because she had good handwriting) to write the questions on the ditto master. Copies of the letter and questionnaire were then run off on the ditto machine. Figures C2-6 and C2-7 show the final letter and questionnaire.

For the next several days small groups made appointments to visit with the principals of the three houses. The principals read and commented favorably on their letter and questionnaire and gave their approval for the class to place them in teachers' mailboxes.

The letter and questionnaire were subsequently placed in all the teachers' mailboxes in the three houses. Of the twenty-one responses that were returned one week later, nineteen were in favor of written rules for the whole school. One teacher felt that it was extremely difficult to find common rules for all three houses. Another teacher felt that there should be additional rules for each house.

The children were interested in the teachers' comments on their rules. One teacher expressed that being considerate to others should be a way of life, not a rule. Another teacher suggested that rules 1 and 2 ("Please be considerate and don't leave school without permission" and "Please be considerate of others") could be combined since they were quite similar. Rule 3 ("Please do not bring hardballs to school for your own safety") was thought to be too specific and that a rule on safety would be better. One teacher suggested combining this rule with rule 4 ("Guns can be dangerous"). For rule 5 ("Please don't lean out of windows for your own safety"), one teacher suggested that it be broadened to compass other safety measures.

We all agreed that the general consensus of the other

Dear Teachers

Jr 3 Cox has been working on a special project connected with the USMES program involving problem solving. Since September they have been working on School Rules. Firstly they formulated their own classroom rules. From there on, they decided to investigate the rules throughout the school. They found that although there were no written rules that applied to the whole school each house had their own rules. They felt that since there were rules that were similar in all three houses that some rules should be formulated that applied to the whole school.

After they had collected information from Principals of the three houses on the general rules in the houses, they came up with 8 that were applicable to all 3 houses. However, they felt that 8 were too many. The fewer rules they felt they had the better they would be observed. Their final step was to survey over 200 students from all three houses asking which of the eight rules they had come up with were ones they agreed with. The following are the five finalists. (The wording of the rules is the children's)

1) Please be considerate and don't leave school without permission
2) " " " of others
3) Please do not bring handballs to school for your own safety
4) Guns can be dangerous
5) Please do not lean out of windows for your own safety

What can you do to help?

The children have suggested that teachers be approached on their feelings about what they had been doing and what they have come up with. They have approached Principals and the Director and asked that their ideas be discussed with you.

This letter to you was written at their request as they found this too difficult a Task to take on.

They would like your comments, ideas, suggestions as to whether a small list of school rules is necessary throughout the school or what are your comments on the rules they have formulated are etc.

Could you please take a few moments to fill out the attached questionnaire compiled by the children. It's very important to them. Please do not hesitate to be negative as the children are working on PROBLEM SOLVING and a main object of the project is to deal with REAL PROBLEMS.

Thank in advance for your cooperation

M C

Figure C2-6

Jr 3 Cox Questionnaire

Please return this to Ms. Coxes mailbox

1. Do you think we should have a set of written rules that apply to the whole school

Yes ☐ No ☐

2 If "no" then why? Please comment

3. If "Yes" here are our 5 rules check the rules you like

4. Please be considerate and don't leave shool without permision Yes ☐ No ☐
2. Please be considerate of others Yes ☐ No ☐
3 Please do not bring handballs to school for your own safety. Yes ☐ No ☐
4 Guns can be dangerous Yes ☐ No ☐
5. Please don't lean out of windows for your own safety Yes ☐ No ☐

4 comment on rules you don't like

5 Do you like the way we are doing this

Yes ☐ No ☐

6 Do you have any other comments or idea

Figure C2-7

teachers on the students' rules was that of approval. We decided that we would rewrite and combine the rules to follow some of the teachers' suggestions.

Several children felt that the first rule ("Please be considerate and don't leave school without permission") did not sound like a rule. One boy recommended that we return to the original wording, "No leaving school without permission." This idea was accepted. The second rule ("Be considerate of others") remained the same. The children broadened the third rule ("Please do not bring hard balls to school for your own safety") to include all dangerous items. The reworded rule was "Do not use objects that can be dangerous in the playground, e.g., Frisbees, hard balls, skateboards, roller skates." The fourth rule, ("No guns allowed") was changed to read "Guns can be dangerous," while the fifth rule ("No leaning out of windows") was revised to read "No leaning or shouting out of windows."

The children were satisfied with their revisions and agreed that their next step was to present them to the director of the school. The class chose a small delegation to approach the director to explain our work and to see whether we could implement our rules on a schoolwide basis.

During the meeting with the director, each member of the group had the opportunity to explain our class activities on School Rules. The explanation lead to their proposal that the five rules be applied to the entire school. The director felt that the rules were good and told them that in order for them to be implemented he would need the approval of the teaching staff. Because it was so close to the end of the school year, he promised he would submit their rules proposal to the school faculty at the beginning of the next school year.

3. LOG ON SCHOOL RULES

by Mary Ellen Warner*
Wallace Middle School, Grade 8
Charleston, South Carolina
(September 1974-January 1975)

ABSTRACT

After several weeks of complaining about a lack of special privileges for eighth graders, this class decided to investigate ways they could obtain some privileges. They listed all the privileges they wished to have and later surveyed the other eighth-grade classes to determine their desires. By way of a vote, the list was pared to two top choices, a Friday afternoon free period and a Coke machine. In order to obtain either privilege, the class agreed to meet with the eighth-grade teachers to determine what they would require before agreeing to either of the two privileges. The class learned that tardiness was a big concern among the teachers as well as overall behavior. After checking with the assistant principal, the class investigated getting a Coke machine. However, they were turned down by the company because of previous vandalism in the school. The class then informed the other eighth graders that the Friday free period was contingent on being on time to classes and on behaving well. After several weeks the eighth graders earned the Friday afternoon free periods, which were held in the school cafeteria.

From the beginning of school my students had been complaining about how they were not able to have any privileges at school. After one of these complaining days we talked about this problem and discussed what we could do about it.

The students had many ideas of privileges they desired. We decided to list all of their ideas on the board. Some of their ideas included the following:

smoking
recess during eighth period (last period of the day)
go to Burger King for lunch
get out of school early in order to get on the buses first
Coke machine
air conditioning
open campus (leave school grounds when you did not have a class)

*Edited by USMES staff

no dress code
longer recesses

Realizing that they could not work for all these privileges at the same time, the class became involved in an extensive debate. One very vocal group wanted to work towards obtaining smoking privileges. One boy suggested that if all the smokers obtained parental permission, the school administration could hardly turn them down. Another suggestion was to have all the smokers congregate in front of the school building and light up!

Before this discussion could get any farther, several nonsmokers raised their objections. One girl felt that this privilege was beneficial to only a few students. She felt that the class should try to obtain a privilege that everyone in the eighth grade wanted. She reminded the class of last year's eighth graders who had the privilege of getting out of school a little early in order to get on the school buses first. However, for reasons unknown, this privilege had not been extended to this year's class. She suggested that perhaps the class could find out why and perhaps reverse this decision. The class was agreeable to this suggestion. Before the class disbanded for the day, they decided that various people should investigate the following questions:

1. Who is responsible for granting eighth-grade privileges?
2. Who was responsible for the "No Smoking" rule?

The following week the class heard the reports of those students who had investigated the smoking rule and the eighth-grade privileges. Reporting on the smoking rule, one boy told the class that the principal had told him that the school board was responsible for this rule. The two girls who had investigated eighth-grade privileges reported that the principal and assistant principal had, as yet, not considered what privilege to grant the eighth graders and would do so soon.

Although some of the smokers still wanted to seek the smoking privilege, the majority of the class wanted to find out what all the eighth graders wanted and to work for that one privilege. The class was quite excited that the principal and assistant principal would consider their ideas.

The class had a lively discussion as to how to survey the entire eighth grade. One suggestion was to gather all

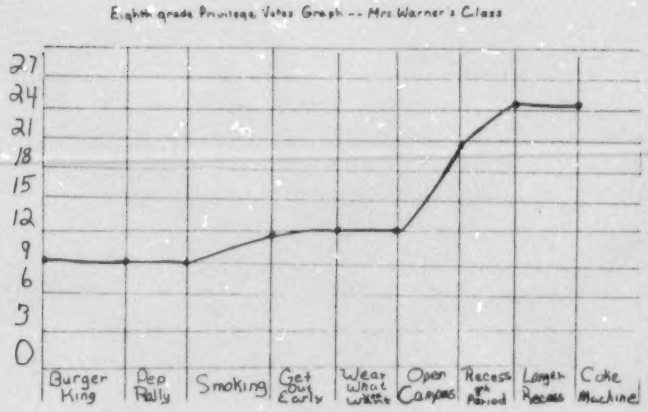

Figure C3-1

the eighth graders in the cafeteria and allow everyone to give his ideas; however, this idea was rejected after they realized that it would be too difficult to keep track of all the ideas. Also, many students felt that a lot of the students would make too much noise and fool around.

A second idea was to design a survey listing all their proposed privileges. The respondent would then check the privileges he wanted the most. One boy wondered what would happen if a respondent did not want any of the privileges listed. The class felt that this person could write in his preference at the bottom of the survey sheet. However, after some thought the students felt that write-ins plus their own list would be too much trouble. The last idea, which was accepted by the class, was to have each eighth grader write down the one privilege he wanted the most.

Several days were spent making preparations for the survey. In order to prepare the ballots, the class estimated the number of eighth graders in the school. Knowing that there were eleven classes, the students estimated that each class contained approximately thirty students. Multiplying, they came up with a total of 330 eighth graders. The class consequently cut approximately 330 paper ballots of equal size. They decided that the ballots would be easier to count if they were all the same size.

The survey was administered to all the classes by pairs of students. To facilitate the tallying, the class put all those suggestions that sounded alike in the same pile. The results revealed thirteen different privileges that the eighth graders wanted. These privileges along with the total votes are shown below. One girl made a graph of the data as shown in Figure C3-1.

Privilege	Number of Votes
Coke machine	84
Leave school ground during lunch (Go to Burger King, Grants, etc.)	59
Get out of school early	57
Have eighth period to go outside	14
Have pep rallies	5
Allowed to smoke	5
Have an open campus	2

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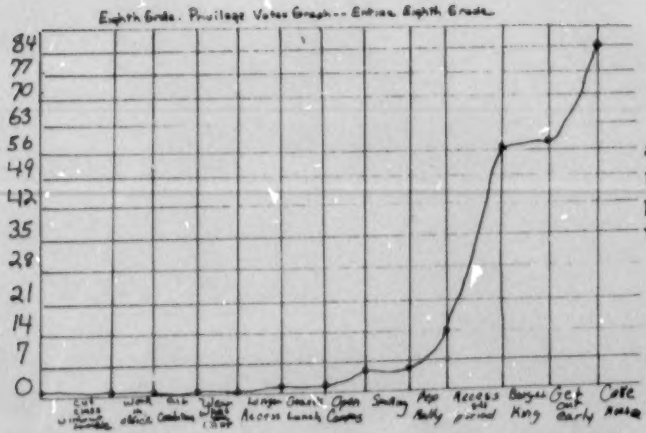


Figure C3-2

Privilege	Number of Votes
Have parties	2
Eat first	1
No dress code	1
Allowed to cut classes	1
Air conditioning	1
Long recesses	1
Total Votes	233

The class realized that the list needed to be reduced, and they decided to accomplish this by voting. They agreed that at least fifty per cent of the class had to vote for a privilege in order to remain on the list. The resulting vote left nine privileges:

Coke machine
Longer recesses
Have eighth period to go outside
Have an open campus
No dress code
Get out of school early
Allowed to smoke
Have pep rallies
Leave school grounds during lunch

Still not satisfied with this list of nine privileges, the class decided to vote again, using the same percentage requirement. This time three privileges emerged as most desired.* (See Figure C3-2 for a graph of the data.)

Privilege	Number of Votes
Coke machine	25
Longer recesses	25
Have eighth period to go outside	20
Have an open campus	12
No dress code	12
Get out of school early	11
Allowed to smoke	9
Have pep rallies	9
Leave school grounds during lunch	9

*The students might compare the class preferences with preferences of the whole school. This might be followed by a discussion about the different procedures followed and which procedure was more valid.--ED.

The class discussed the two privileges, longer recesses and eighth period outside, and agreed that they were pretty much the same privilege. Several students questioned the practicality of requesting all eighth periods (Monday through Friday) to be recesses! After some debate, the class agreed that their chances of obtaining one afternoon eighth period as recess would be much better. They agreed that Friday afternoons would be best.

We talked about the possibility of obtaining a Coke machine. I told the class that there was a possibility that a Coke machine for students in the schools was against school district policy. The students decided that they would further investigate this.

The class next discussed how to go about obtaining either the Coke machine or Friday afternoon recess. Unanimously, they felt that the only way they could find out would be to meet with the teachers and principal to determine what their requirements were. Deciding that their case would be stronger if the whole eighth-grade faculty supported them, most of the class wanted to meet first with the teachers. After several attempts to make appointments with all the teachers, the class finally got some of the faculty to meet with them during one lunch period.

The meeting with the teachers proved to be both disappointing and successful. The elected group of five students was disappointed that only three teachers showed up. The group explained what the class was working on and the purpose of the meeting. The teachers agreed that either of the two proposed privileges, the Coke machine and the Friday afternoon free period, was reasonable. They told the group that they would feel comfortable granting a Friday free period only if various conditions could be met by the eighth graders. Their conditions were as follows:

1. Students must stop being tardy for class. Everyone must be in their seat when the bell rings, not running in the door.
2. Students must behave during eighth period on the other four days of the week.

The group of students did not feel these requirements were unreasonable.

The group reported to the class on their meeting with the three teachers. The class also agreed that the two requirements were reasonable. They began making plans to inform the rest of the eighth graders what privilege would be

granted if these two requirements were met. They listed on the board four different ways of informing the other classes:

1. Hold a meeting in the school cafeteria.
2. Use the intercom to make an announcement.
3. Hold a meeting with the Student Council representatives. They in turn would tell their respective classes.
4. Have the students go to the various eighth-grade classrooms.

Each suggestion was mulled over and in the end the last suggestion was accepted. Before informing the other classes of their plan, however, the class agreed that it would be a good idea to seek the principal's permission first, and they made an appointment.

The assistant principal came to the class to discuss the eighth-grade privileges. He reviewed their original list of nine privileges and gave the reasons why many of them could not be granted. For example, it was the policy of the school board as well as a state law that prohibited students from leaving the school ground during school hours since the school was legally responsible for its students during those hours. The assistant principal was agreeable to the Coke machine--he did not think the machines were against district policy--and Friday free period provided the class could work out the details for either one.

After their meeting with the assistant principal, the class's interest in the Coke machine was sparked. They decided to drop their efforts for Friday free period and focus on obtaining a Coke machine. A list of problems they would have to overcome was made:

1. Who is responsible for the machine's repairs?
2. Times when students can drink Coke?
3. Not enough Cokes in one machine to supply all the eighth graders.
4. If more than one machine, what would be the quota of Cokes per student?
5. What do we do with people who bang on the machine?
6. Where do we put the machine?
7. How do we get money to get started?
8. Who will make sure Coke bottles are not thrown everywhere?

The list of problems raised another one that had not been listed, vandalism. Several students reminded the class about the incident that had occurred on the preceeding night. The teacher's lounge had been broken into and the Coke machine destroyed. The class agreed that this was a real problem. No one, however, could think of a solution at the time, and so the matter was temporarily dropped. A committee was appointed to call the Coke company to see what the possibilities were in getting a machine installed.

A few days later, the phone group revealed that the company rejected their offer of installing a machine at Wallace because previous machines had been vandalized too often.*

The class subsequently returned to obtaining the Friday free period privilege. They informed the rest of the eighth graders of the two requirements that had to be met in order to obtain the Friday afternoon free period. For several weeks the eighth graders made special efforts to be on time for their classes. In January the principal announced at a faculty meeting that the students could have the Friday eighth period as a free time. However, the students could not go outside and had to use the cafeteria instead. For the first Friday free period, the eighth graders held a dance. In the ensuing months the eighth graders continued to have their Friday afternoon free periods. However, because another program needed to use the cafeteria the free periods occurred every other Friday until the end of school.

*The students might discuss other ways to get a Coke machine, perhaps by calling another company.--ED.

D. References

1. LIST OF "HOW TO" CARDS

Below are listed the current "How To" Card titles that students working on the School Rules challenge might find useful. A complete listing of both the "How To" Cards and the Design Lab "How To" Cards is contained in the *USMES Guide*. In addition, the *Design Lab Manual* contains the list of Design Lab "How To" Cards.

GRAPHING

GR 1 How to Make a Bar Graph Picture of Your Data
GR 2 How to Show the Differences in Many Measurements or Counts of the Same Thing by Making a Histogram
GR 7 How to Show Several Sets of Data on One Graph

MEASUREMENT

M 2 How to Measure Distances
M 9 How to Make a Conversion Graph to Use in Changing Measurements from One Unit to Another Unit
M 10 How to Use a Conversion Graph to Change *Any* Measurement in One Unit to Another Unit

PROBABILITY AND STATISTICS

PS 2 How to Record Data by Tallying
PS 3 How to Describe Your Set of Data by Finding the Average
PS 4 How to Describe Your Set of Data by Using the Middle Piece (Median)
PS 5 How to Find the Median of a Set of Data From a Histogram

RATIOS, PROPORTIONS, AND SCALING

R 1 How to Compare Fractions or Ratios by Making a Triangle Diagram

New titles to be added:

How to Round Off Data
How to Design and Analyze a Survey
How to Choose a Sample
How to Make and Use a Cumulative Distribution Graph
How to Record Your Data
How to Design an Experiment
How to Make a Q-Q Graph

A cartoon-style set of "How To" Cards for primary grades is being developed from the present complete set. In most cases titles are different and contents have been rearranged among the various titles. It is planned that this additional set will be available early in 1977.

2. LIST OF BACKGROUND PAPERS

As students work on USMES challenges, teachers may need background information that is not readily accessible elsewhere. The Background Papers fulfill this need and often include descriptions of activities and investigations that students might carry out.

Below are listed titles of current Background Papers that teachers may find pertinent to School Rules. The papers are grouped in the categories shown, but in some cases the categories overlap. For example, some papers about graphing also deal with probability and statistics.

The Background Papers are being revised, reorganized, and rewritten. As a result, many of the titles will change.

GRAPHING

GR 3 Using Graphs to Understand Data by Earle Lomon

GR 4 Representing Several Sets of Data on One Graph by Betty Beck

GR 7 Data Gathering and Generating Graphs at the Same Time (or Stack 'Em and Graph 'Em at One Fell Swoop!) by Edward Liddle

GROUP DYNAMICS

GD 2 A Voting Procedure Comparison That May Arise in USMES Activities by Earle Lomon

MEASUREMENT

M 3 Determining the Best Instrument to Use for a Certain Measurement by USMES Staff

PROBABILITY AND STATISTICS

PS 4 Design of Surveys and Samples by Susan J. Devlin and Anne E. Freeny

PS 5 Examining One and Two Sets of Data Part I: A General Strategy and One-Sample Methods by Lorraine Denby and James Landwehr

PS 6 Examining One and Two Sets of Data Part II: A Graphical Method for Comparing Two Samples by Lorraine Denby and James Landwehr

RATIOS, PROPORTIONS, AND SCALING

R 1 Graphic Comparison of Fractions by Merrill Goldberg
R 2 Geometric Comparison of Ratios by Earle Lomon

3. BIBLIOGRAPHY OF NON-USMES MATERIALS

The following materials are references that may be of some use during work on School Rules. The teacher is advised to check directly with the publisher regarding current prices. A list of references on general mathematics and science topics can be found in the *USMES Guide*.

Reference Books for Students

Workshop for Learning Things, 5 Bridge Street, Watertown, Massachusetts 02172. *Children Write*. ($3.50)
A folder containing children's writings, drawings, and photographs. Good examples for students who are producing their own books.

Sources of Inexpensive Media Equipment

Both sources listed below sell excellent, low-cost materials which have been especially developed for children's use. Write for each project's catalog for more complete descriptions and ordering forms.

Workshop for Learning Things, 5 Bridge Street, Watertown, Massachusetts 02172. *Our Catalog*. ($1.00)

_____. *Bookkeeping Instruction Kit*. ($5.95)
Includes posters with instructions for three months of bookbinding and tools and materials to make five separate books of three kinds.

_____. *Paper Making Kit*. ($68.00)
All necessary materials and instructions for a simple method of making recycled paper in small quantities.

_____. *Offset Printing Press*. ($19.50)
Reusable press and supplies for transferring printing from master sheet onto paper up to 8½" x 11".

_____. *Printing Press Kit*. ($163.00)
Contains type case, press bed, type font, and all other equipment needed for printing.

_____. *The Label Press*. ($1.00)
A booklet with suggestions for children on using plastic label makers for printing multiple copies.

Elementary Science Study (ESS). *Children Printing*.
Distributed by the Teachers Bookshop, 90 Sherman Street, Cambridge, Massachusetts 02140. ($1.50)
Samples of their own printing produced by children from grades one to six, done mainly on letter press and silk screen press.

4. GLOSSARY

The following definitions may be helpful to a teacher whose class is investigating a School Rules challenge. Some of the words are included to give the teacher an understanding of technical terms; others are included because they are commonly used throughout the resource book.

These terms may be used when they are appropriate for the children's work. For example, a teacher may tell the children that when they conduct surveys, they are collecting *data*. It is not necessary for the teacher or students to learn the definitions nor to use all of these terms while working on their challenge. Rather, the children will begin to use the words and understand the meanings as they become involved in their investigations.

Average	The numerical value obtained by dividing the sum of the elements of a set of data by the number of elements in that set. Also called the mean.
Bias	A deviation in the expected values of a set of data, often occurring when some factor produces one outcome more frequently than others.
Conversion	A change from one form to another. Generally associated in mathematics and science with the change from one unit of measure to another or the change from one form of energy to another.
Correlation	A relationship between two sets of data.
Cost	The amount of money needed to produce or to purchase goods or services.
Data	Any facts, quantitative information, or statistics.
Distribution	The spread of data over the range of possible results.
Division of Labor	The process by which a complicated task is reduced to a series of simple tasks. Each task is normally performed repetitively by the same worker.
Edit	To collect and arrange materials into a finished publication or program.

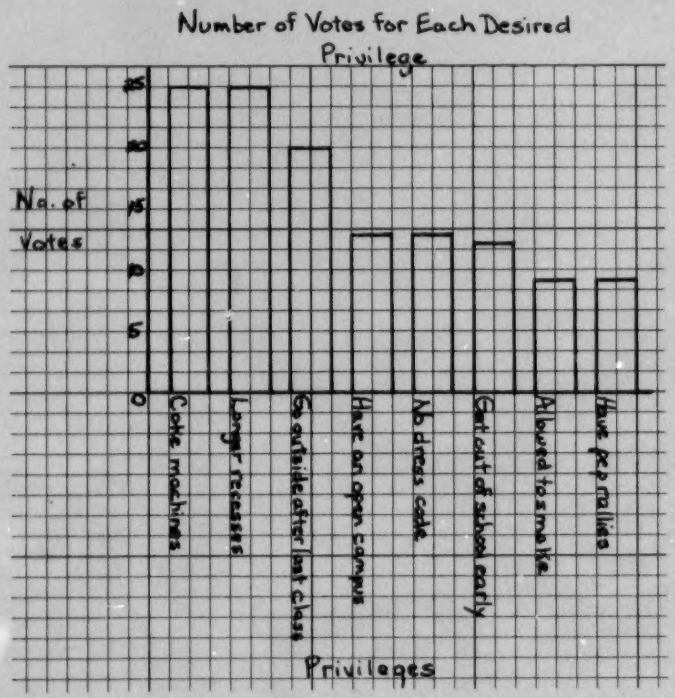
Event — A happening; an occurrence; something that takes place. Example: a violation of a rule.

Frequency — The number of times a certain event occurs in a given unit of time or in a given total number of events.

Graph — A drawing or a picture of one or several sets of data.

Bar Graph — A graph of a set of measures or counts whose sizes are represented by the vertical (or horizontal) length of bars of equal widths. Example: number of votes for each desired eighth-grade privilege.

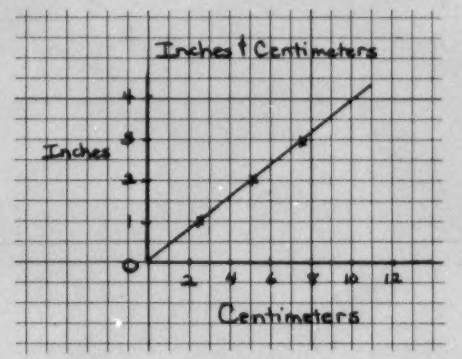
Desired Privilege	Number of Votes
Coke machines	25
Longer recesses	25
Go outside after last class	20
Have an open campus	12
No dress code	12
Get out of school early	11
Allowed to smoke	9
Have pep rallies	9



Conversion Graph

A line graph that is used to change one unit of measurement to another. For example, converting inches to centimeters.

Inches	Centimeters
1	2.54
2	5.08
3	7.62

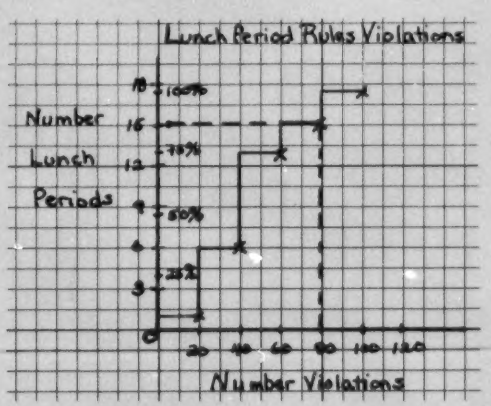


Cumulative Distribution Graph

A graph that can be constructed from a histogram by computing running totals from the histogram data. The first running total is the first value in the histogram data (see table of values). The second running total is the sum of the first and second values of the histogram, the third is the sum of the first, second, and third values, and so on. The horizontal scale on the graph is similar to that of the histogram; the vertical scale goes from 0 to the total number of events observed or samples taken (in the example, the total number of lunch periods that had rules violations). Each vertical distance on the graph shows the running total of the number of samples taken that are less than or equal to the value shown on the horizontal scale; thus the graph below indicates that fifteen (or about 88%) of the lunch periods had 80 or fewer rules violations.

Table of Values

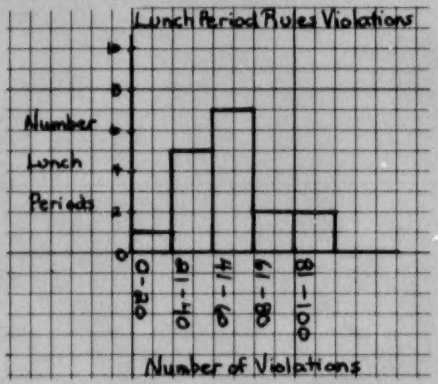
Number Violations	Number Lunch Periods Running Totals
20 or fewer	1
40 or fewer	6
60 or fewer	13
80 or fewer	15
100 or fewer	17



Histogram

A type of bar graph that shows the distribution of the number of times that different measures or counts of the same event have occurred. A histogram always shows ordered numerical data on the horizontal axis. Example: the number of lunch periods with different number of violations.

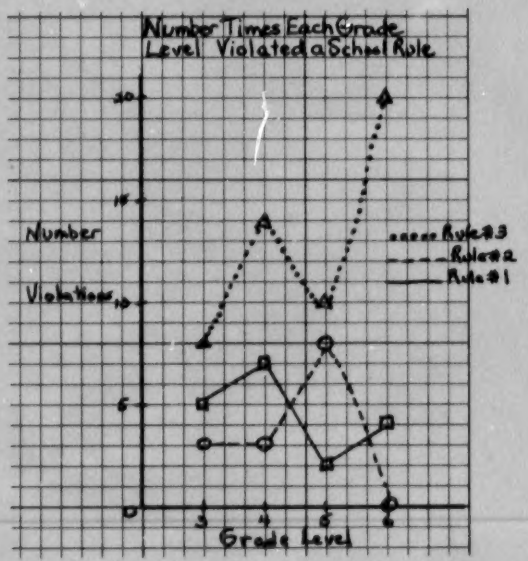
Number Violations	Number Lunch Periods
0-20	1
21-40	5
41-60	7
61-80	2
81-100	2



Line Chart

A bar graph that is represented by circles, triangles, or crosses with lines connecting them so that it has the appearance of a line graph. (See *Line Graph*.) This is a useful representation when two or more sets of data are shown on the same graph. Example: comparing the number of times each grade level violated a school rule.

Grade Level	Number Violations Rule #1	Rule #2	Rule #3
3	5	3	8
4	7	3	14
5	2	8	10
6	4	0	20



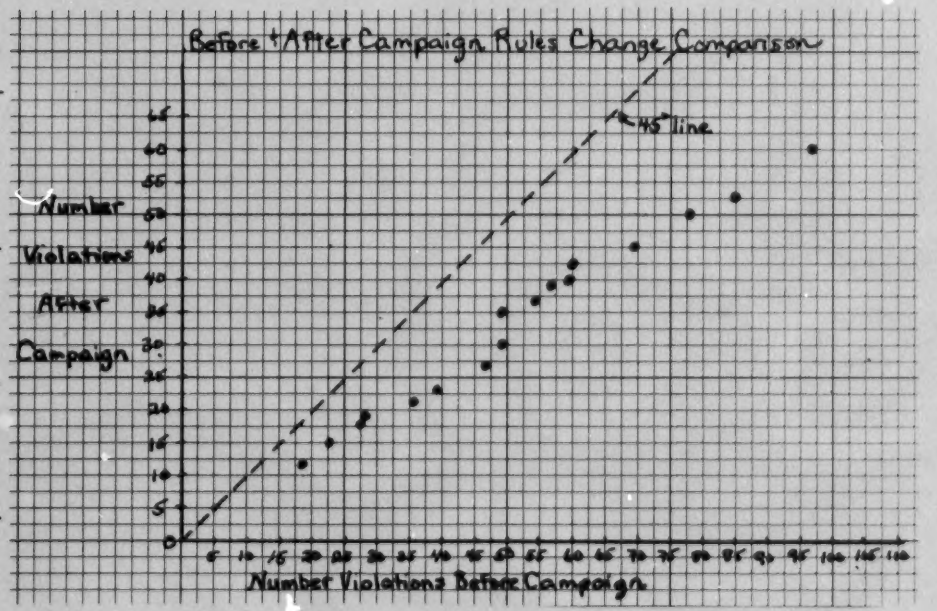
Line Graph

A graph in which a smooth line or line segments pass through or near points representing members of a set of data. Since the line represents an infinity of points, the variable on the horizontal axis must be continuous. If the spaces between the markings on the horizontal axis have no meaning, then the graph is not a line graph, but a line chart.

Q-Q Graph

A graph that shows the comparison between the same type of data collected from two groups of people,...from two different situations. Example: comparing the number of rules violations before and after an "obey the school rules" campaign. The data for each set is ordered and the smallest measurement of one set is plotted against the smallest of the other set, the second smallest against the second smallest, and so on. The scatter of points is compared to a reference line, a dashed 45° line that represents data from two identical sets.

Number Violations Before Campaign	Number Violations After Campaign
18	12
22	15
27	17
27	18
36	21
39	23
47	27
49	30
49	35
54	37
57	39
59	40
60	43
69	45
78	50
85	53
98	59


Before + After Campaign Rules Change Comparison
45° line
Number Violations After Campaign
Number Violations Before Campaign

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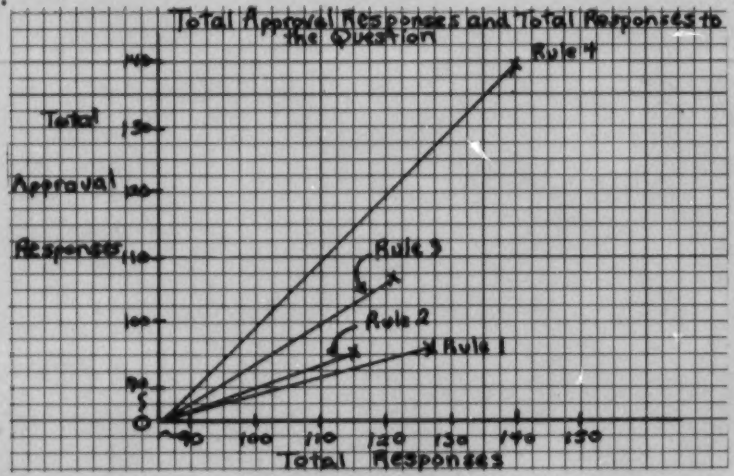
*Slope Diagram**

A graphical means of comparing fractions or ratios. To represent the ratio a/b, plot the point (b,a) and draw a line from (b,a) to the origin, (0,0). The slope of this line represents the ratio a/b. By comparing slopes of several lines, different ratios or percentages can be compared; the steeper the line, the larger the ratio. For example, in the graph below showing the ratio of rules approvals to total number of students who responded to the question, the ratio (or percentage) of students approving rule #4 is larger than the ratios (or percentages) approving rules #3, #2, and #1.

	Total Response to Each Rule	Total Approval Responses
Rule 1	128	96
Rule 2	115	95
Rule 3	121	107
Rule 4	140	138



Histogram

See *Graph*.

Hypothesis

A tentative conclusion made in order to test its implications or consequences.

Inference

An assumption derived from facts or information considered to be valid and accurate.

Mean

See *Average*.

Median

The middle value of a set of data in which the elements have been ordered from smallest to largest. The median value has as many elements above it as below it.

Mode

The element or elements in a set of data that occur most often.

*Formerly called triangle diagram.

Ordered Set	A set of data arranged from smallest to largest.
Per Cent	Literally per hundred. A ratio in which the denominator is always 100, e.g., 72 per cent = 72/100 = 0.72 = 72% , where the symbol % represents 1/100.
Percentage	A part of a whole expressed in hundredths.
Population	Any group of objects (e.g., people, animals, items) or events from which samples are taken for statistical measurement.
Probability	The likelihood or chance (expressed numerically) of one event occurring out of several possible events.
Proportion	A statement of equality of two ratios, i.e., the first term divided by the second term equals the third term divided by the fourth term, e.g., 5/10 = 1/2. Also a synonym for ratio: when two quantities are in direct proportion, their ratios are the same.
Quartile	
First	The first quartile is the value of the quarter-way piece of data in an ordered set of data.
Third	The third quartile is the value of the three-quarter-way piece of data in an ordered set of data.
Interquartile Range	The range or length of the middle 50% of an ordered set of data; the difference between the first and third quartile.
Range	The difference between the smallest and the largest values in a set of data.
Rank	To order the members of a set according to some criterion, such as size or importance. Example: to put pieces of data from smallest to largest.
Ratio	The quotient of two denominate numbers or values indicating the relationship in quantity, size, or amount between two different things. For example, the ratio of the number of children who felt all the school rules were good vs. the total number of children in the grade.
Sample	A representative fraction of a population studied to gain information about the whole population.
Sample Size	The number of elements in a sample.

Set	A collection of characteristics, persons, or objects. Each thing in a set is called a member or an element.
Set Theory	The branch of mathematics that deals with the nature and relations of sets.
Complement of a Set	The set of all elements in the universal set but not in the given set. For example, if the universal set is the set of all students in a class, then the set of girls is the complement of the set of boys.
Intersection of Sets	The set of elements common to two or more sets. For example, if set A is all girls and set B is all blue-eyed children, the intersection of set A and set B is the set of blue-eyed girls.
Universal Set	A set that contains all elements relevant to a particular problem.
Venn Diagram	A drawing used to illustrate the relationship between sets.
Slope Diagram	See *Graph*.
Statistics	The science of drawing conclusions or making predictions using a collection of quantitative data.
Tally	A visible record used to keep a count of some set of data, especially a record of the number of times one or more events occur. Example: tallying opinion survey data.

E. Skills, Processes, and Areas of Study Utilized in School Rules

The unique aspect of USMES is the degree to which it provides experience in the process of solving real problems. Many would agree that this aspect of learning is so important as to deserve a regular place in the school program even if it means decreasing to some extent the time spent in other important areas. Fortunately, real problem solving is also an effective way of learning many of the skills, processes, and concepts in a wide range of school subjects.

On the following pages are five charts and an extensive, illustrative list of skills, processes, and areas of study that are utilized in USMES. The charts rate School Rules according to its potential for learning in various categories of each of five subject areas--real problem solving, mathematics, science, social science, and language arts. The rating system is based on the amount that each skill, process, or area of study within the subject areas is used--extensive (1), moderate (2), some (3), little or no use (-). (The USMES Guide contains a chart that rates all USMES units in a similar way.)

The chart for real problem solving presents the many aspects of the problem-solving process that students generally use while working on an USMES challenge. A number of the steps in the process are used many times and in different orders, and many of the steps can be performed concurrently by separate groups of students. Each aspect listed in the chart applies not only to the major problem stated in the unit challenge but also to many of the tasks each small group undertakes while working on a solution to the major problem. Consequently, USMES students gain extensive experience with the problem-solving process.

The charts for mathematics, science, social science, and language arts identify the specific skills, processes, and areas of study that may be learned by students as they respond to a School Rules challenge and become involved with certain activities. Because the students initiate the activities, it is impossible to state unequivocally which activities will take place. It is possible, however, to document activities that have taken place in USMES classes and identify those skills and processes that have been used by the students.

Knowing in advance which skills and processes are likely to be utilized in School Rules and knowing the extent that they will be used, teachers can postpone the teaching of

those skills in the traditional manner until later in the year. If the students have not learned them during their USMES activities by that time, they can study them in the usual way. Further, the charts enable a teacher to integrate USMES more readily with other areas of classroom work. For example, teacher may teach fractions during math period when fractions are also being learned and utilized in the students' USMES activities. Teachers who have used USMES for several successive years have found that students are more motivated to learn basic skills when they have determined a need for them in their USMES activities. During an USMES session the teacher may allow the students to learn the skills entirely on their own or from other students, or the teacher may conduct a skill session as the need for a particular skill arises.

Because different USMES units have differing emphases on the various aspects of problem solving and varying amounts of possible work in the various subject areas, teachers each year might select several possible challenges, based on their students' previous work in USMES, for their class to consider. This choice should provide students with as extensive a range of problems and as wide a variety of skills, processes, and areas of study as possible during their years in school. The charts and lists on the following pages can also help teachers with this type of planning.

Some USMES teachers have used a chart similar to the one given here for real problem solving as a record-keeping tool, noting each child's exposure to the various aspects of the process. Such a chart might be kept current by succeeding teachers and passed on as part of a student's permanent record. Each year some attempt could be made to vary a student's learning not only by introducing different types of challenges but also by altering the specific activities in which each student takes part. For example, children who have done mostly construction work in one unit may be encouraged to take part in the data collection and data analysis in their next unit.

Following the rating charts are the lists of explicit examples of real problem solving and other subject area skills, processes, and areas of study learned and utilized in School Rules. Like the charts, these lists are based on documentation of activities that have taken place in USMES classes. The greater detail of the lists allows teachers to see exactly how the various basic skills, processes, and areas of study listed in the charts may arise in School Rules.

The number of examples in the real problem solving list

have been limited because the list itself would be unreasonably long if all the examples were listed for some of the categories. It should also be noted that the example(s) in the first category--*Identifying and Defining Problems*--have been limited to the major problem that is the focus of the unit. During the course of their work, the students will encounter and solve many others, secondary problems, such as the problem of how to display their data or how to draw a scale layout.

Breaking down an interdisciplinary curriculum like USMES into its varous subject area components is a difficult and highly inexact procedure. Within USMES the various subject areas overlap significantly, and any subdivision must be to some extent arbitrary. For example, where does measuring as a mathematical skill end and measurement as science and social science process begin? How does one distinguish between the processes of real problem solving, of science, and of social science? Even within one subject area, the problem still remains--what is the difference between graphing as a skill and graphing as an area of study? This problem has been partially solved by judicious choice of examples and extensive cross-referencing.

Because of this overlap of subject areas, there are clearly other outlines that are equally valid. The scheme presented here was developed with much care and thought by members of the USMES staff with help from others knowledgeable in the fields of mathematics, science, social science, and language arts. It represents one method of examining comprehensively the scope of USMES and in no way denies the existence of other methods.

REAL PROBLEM SOLVING	Overall Rating
Identifying and defining problem.	1
Deciding on information and investigations needed.	1
Determining what needs to be done first, setting priorities.	1
Deciding on best ways to obtain information needed.	1
Working cooperatively in groups on tasks.	1
Making decisions as needed.	1
Utilizing and appreciating basic skills and processes.	1
Carrying out data collection procedures--opinion surveying, researching, measuring, classifying, experimenting, construction.	1
Asking questions, inferring.	1
Distinguishing fact from opinion, relevant from irrelevant data, reliable from unreliable sources.	1
Evaluating procedures used for data collection and analysis. Detecting flaws in process or errors in data.	1

REAL PROBLEM SOLVING	Overall Rating
Organizing and processing data or information.	1
Analyzing and interpreting data or information.	1
Predicting, formulating hypotheses, suggesting possible solutions based on data collected.	1
Evaluating proposed solutions in terms of practicality, social values, efficacy, aesthetic values.	1
Trying out various solutions and evaluating the results, testing hypotheses.	1
Communicating and displaying data or information.	1
Working to implement solution(s) chosen by the class.	1
Making generalizations that might hold true under similar circumstances; applying problem-solving process to other real problems.	1

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

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MATHEMATICS	Overall Rating
Basic Skills	
Classifying/Categorizing	3
Counting	1
Computation Using Operations	
Addition/Subtraction	3
Multiplication/Division	3
Fractions/Ratios/Percentages	2
Business and Consumer Mathematics/ Money and Finance	-
Measuring	3
Comparing	3
Estimating/Approximating/Rounding Off	3
Organizing Data	2
Statistical Analysis	3
Opinion Surveys/Sampling Techniques	1
Graphing	3
Spatial Visualization/Geometry	-
Areas of Study	
Numeration Systems	3
Number Systems and Properties	3
Denominate Numbers/Dimensions	3
Scaling	-
Symmetry/Similarity/Congruence	-
Accuracy/Measurement Error/ Estimation/Approximation	3
Statistics/Random Processes/Probability	3
Graphing Functions	3
Fraction/Ratio	2
Maximum and Minimum Values	-
Equivalance/Inequality/Equations	3
Money/Finance	-
Set Theory	-

SCIENCE	Overall Rating
Processes	
Observing/Describing	1
Classifying	3
Identifying Variables	3
Defining Variables Operationally	3
Manipulating, Controlling Variables/ Experimenting	3
Designing and Constructing Measuring Devices and Equipment	3
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	1
Measuring/Collecting, Recording Data	1
Organizing, Processing Data	1
Analyzing, Interpreting Data	1
Communicating, Displaying Data	1
Generalizing/Applying Process to New Problems	1
Areas of Study	
Measurement	3
Motion	-
Force	-
Mechanical Work and Energy	-
Solids, Liquids, and Gases	-
Electricity	-
Heat	-
Light	-
Sound	-
Animal and Plant Classification	-
Ecology/Environment	-
Nutrition/Growth	-
Genetics/Heredity/Propagation	-
Animal and Plant Behavior	-
Anatomy/Physiology	-

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

SOCIAL SCIENCE	Overall Rating
Process	
Observing/Describing/Classifying	1
Identifying Problems, Variables	1
Manipulating, Controlling Variables/ Experimenting	3
Inferring/Predicting/Formulating, Testing Hypotheses	1
Collecting, Recording Data/Measuring	2
Organizing, Processing Data	2
Analyzing, Interpreting Data	2
Communicating, Displaying Data	2
Generalizing/Applying Process to Daily Life	1
Attitudes/Values	
Accepting responsibility for actions and results	1
Developing interest and involvement in human affairs	1
Recognizing the importance of individual and group contributions to society	1
Developing inquisitiveness, self-reliance, and initiative	1
Recognizing the values of cooperation, group work, and division of labor	1
Understanding modes of inquiry used in the sciences, appreciating their power and precision	1
Respecting the views, throughts, and feelings of others	1
Being open to new ideas and information	1
Learning the importance and influence of values in decision making	1
Areas of Study	
Anthropology	-
Economics	-
Geography/Physical Environment	-
Political Science/Government Systems	1
Recent Local History	1
Social Psychology/Individual and Group Behavior	1
Sociology/Social Systems	1

LANGUAGE ARTS	Overall Rating
Basic Skills	
Reading:	
Literal Comprehension: Decoding Words, Sentences, Paragraphs	2
Critical Reading: Comprehending Meanings, Interpretation	3
Oral Language:	
Speaking	1
Listening	1
Memorizing	-
Written Language:	
Spelling	2
Grammar: Punctuation, Syntax, Usage	2
Composition	2
Study Skills:	
Outlining/Organizing	2
Using References and Resources	2
Attitudes/Values	
Appreciating the value of expressing ideas through speaking and writing	1
Appreciating the value of written resources	3
Developing an interest in reading and writing	3
Making judgments concerning what is read	3
Appreciating the value of different forms of writing, different forms of communication	1

KEY: 1 = extensive use, 2 = moderate use, 3 = some use, - = little or no use

REAL PROBLEM SOLVING IN SCHOOL RULES

Identifying and Defining Problems	• Students express a dislike for some of the school rules. • Students note that many classmates are unaware of what the school rules are. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables.*
Deciding on Information and Investigations Needed	• Students decide that they need to determine what the school rules are. Students decide where to obtain this information. • Students decide to find out how many students in the school know the school rules and to find out which rules are considered good rules, unpopular rules, and important rules.
Determining What Needs to Be Done First, Setting Priorities	• Students decide that they first need to find out what the school rules are before investigating whether students know about the rules and whether they like them.
Deciding on Best Ways to Obtain Information Needed	• Students decide that the principal and the school staff would be good people to interview to determine what the school rules are. • Students decide that an opinion survey would be the best way to find out how other students feel about the school rules.
Working Cooperatively in Groups on Tasks	• Students work in small groups when conducting an opinion survey, collecting data on rules being obeyed, and making posters and rules handbooks.
Making Decisions as Needed	• Students decide to make an appointment with the principal and prepare an explanation of what their class plans to do. • Students determine the total number of students in the school and decide to survey a sample. The students decide what a good representative sample would be and choose the best way to pick the sample randomly.

Making Decisions as Needed (cont.)	• Students decide upon the best way to administer the opinion survey. • Students decide to represent their opinion survey results on graphs.
Utilizing and Appreciating Basic Skills and Processes	• Students make a bar graph of their opinion survey results. • Students determine the total number of students in the school. • Students decide what attributes an eye-catching poster should possess, e.g., sharp contrast between lettering and background. • Students use rulers to measure letters of equal size on their posters. • Students explain orally to other classes and to the principal what their class is doing about the school rules. • Students prepare handbooks of the school rules. • See also MATHEMATICS, SCIENCE, SOCIAL SCIENCE and LANGUAGE ARTS lists.
Carrying Out Data Collection Procedures--Opinion Surveying, Researching, Measuring, Classifying, Experimenting, Constructing	• Students conduct an opinion survey to find out how other students feel about the school rules. • Students tally the number of students who disobey the school rules during lunch period. • Students classify rules, e.g., classroom rules and school rules, rules for young students and rules for older students. • Students make posters to encourage students to obey the school rules. • See also MATHEMATICS list: *Classifying/Categorizing; Measuring.* • See also SCIENCE list: *Observing/Describing; Classifying; Manipulating, Controlling Variables/Experimenting; Designing and Constructing Measuring Devices and Equipment; Measuring/Collecting, Recording Data.* • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying; Manipulating, Controlling Variables/ Experimenting; Collecting, Recording Data/Measuring.*
Asking Questions, Inferring	• Students question which school rules are best known by students in the school. They infer from the bar graph of their opinion survey results those rules which are known.

Asking Questions, Inferring (cont.)	• Students ask where to hang their posters so that all students will see them. They infer from observations that the cafeteria, the library, and the bathrooms are the best places. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating, Testing Hypotheses.*
Distinguishing Fact from Opinion, Relevant from Irrelevant Data, Reliable from Unreliable Sources	• Students distinguish between the qualitative aspects of obtaining data from opinion surveys (rules which students think are important) and the quantitative data they gather from observations in the hallways (number of violations of important rules). • Students recognize that the principal and school staff are reliable sources of information on school rules.
Evaluating Procedures Used for Data Collection and Analysis, Detecting Flaws in Process or Errors in Data	• Students evaluate the sample used for the opinion survey to see whether a representative number of students in the different grades were surveyed. • Students evaluate the procedure for tallying rule violations to determine whether different criteria were used by different people. • See also MATHEMATICS list: *Estimating/Approximating/ Rounding Off.*
Organizing and Processing Data	• Students compile results of the opinion survey. • Students tally on a chart the number of times a school rule is disobeyed (or obeyed). • See also MATHEMATICS list: *Organizing Data.* • See also SCIENCE and SOCIAL SCIENCE lists: *Organizing, Processing Data.*
Analyzing and Interpreting Data	• Students list the rules they wish to have changed in order of urgency according to opinion survey results. • Students make a bar graph showing frequency of violations of different rules. • Students make a q-q graph to compare the number of rules violations before and after an "obey the school rules" campaign. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Graphing.*

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Analyzing and Interpreting Data (cont.)	• See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data.*
Predicting, Formulating Hypotheses, Suggesting Possible Solutions Based on Data Collected	• Students hypothesize that a few important rules will be remembered better than a long list of all the rules. • Students hypothesize that some rules will be violated more than others at different times of the school day. • Students hypothesize that students will obey the school rules more if there are reminders posted on the school walls. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating, Testing Hypotheses.*
Evaluating Proposed Solutions in Terms of Practicality, Social Values, Efficacy, Aesthetic Values	• Students discuss the advantages and disadvantages of various ways to encourage students to obey the school rules. • Students discuss the effects of the way a rule is worded.
Trying Out Various Solutions and Evaluating the Results, Testing Hypotheses	• Students try several ways of advertising the school rules and evaluate each way by observing the number of rules violations. • Students observe and tally rules violations at different times to determine whether time of day affects types of rules violations. • See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.* • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating, Testing Hypotheses.*
Communicating and Displaying Data or Information	• Students draw a bar graph to show the results of their opinion survey on rules preference. • Students list the school rules on posters and signs and make handbooks of the rules. • See also MATHEMATICS list: *Graphing.* • See also SCIENCE and SOCIAL SCIENCE lists: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.

Working to Implement Solution(s) Chosen by the Class	• Students make a presentation of their "obey the school rules" campaign plans to the principal. • Students institute their campaign to obey the school rules by displaying posters, by making and distributing handbooks and by putting on skits.
Making Generalizations That Might Hold True Under Similar Circumstances; Applying Problem-Solving Process to Other Real Problems	• Students recognize the need for rules in school, at home, and in society and understand the role of a governing body over a body that is governed. • Students recognize that to change or implement a new rule requires going through various process and working with many people. • Students use knowledge and skills acquired to work on classroom rules. • See also SCIENCE list: *Generalizing/Applying Process to New Problems.* • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*

ACTIVITIES IN SCHOOL RULES UTILIZING MATHEMATICS

Basic Skills

Classifying/Categorizing	• Organizing and classifying activities and information. • Classifying results from opinion surveys. • See also SCIENCE and SOCIAL SCIENCE lists: *Observing/Describing/Classifying*.
Counting	• Counting hand votes to determine priorities of tasks. • Counting the number of students who wish to do various tasks. • Counting opinion survey data on school rules preference. • Counting to figure total number of students in the school, total number of teachers. • Counting the number of people who disobeyed various school rules. • Counting the number of posters or rules handbooks that will be needed. • Counting by sets to find scale for graph axes.
Computation Using Operations: Addition/Subtraction	• Adding one-, two-, or three-digit whole numbers to find total tally of opinion survey results, total number of children in each grade, total number of rules violations. • Subtracting the number of rules violations after an "obey the school rules" campaign from the number of rules violations before the campaign. • Subtracting to find the difference between the number of students already surveyed and the total number of students to be surveyed. • Subtracting the number of students who responded to a question in one way from the total number of students who responded to the question on the opinion survey.
Computation Using Operations: Multiplication/Division	• Multiplying the estimated number of students in each class by the number of classes to obtain an estimated school population total. • Dividing the total number of students to be surveyed, the number of tasks to be done, the number of posters and handbooks to be made, etc., by the number of students in the class to determine small group size.

Computation Using Operations: Multiplication/Division (cont.)	• Dividing to find average preference rating for each grade level for various school rules. • Dividing to find percentages of total number of violations for each rule that is violated. • Multiplying or dividing to find a scale for graph axes.
Computation Using Operations: Fractions/Ratios/Percentages	• Using mixed numbers to perform calculations needed to find averages, such as average preference rating for each grade level for various school rules. • Changing fractions to higher or lower terms to perform operations. • Calculating percentages from survey data, such as the percentage of children who feel the school rules are ineffective. • Calculating percentages for each rule violated out of total number of violations. • Using slope diagrams to compare ratios, such as comparing the number of students who think various rules are important and total number of students who responded to the survey question.
Measuring	• Using measuring instruments, such as rulers and meter sticks, when making posters and rules handbooks. • Measuring heights to find best height to place posters. • Using a clock and calendar when recording number of rules violations. • Reading measuring instruments accurately. • Converting from one unit of measurement to another, such as inches to centimeters. • See also SCIENCE list: *Measuring/Collecting, Recording Data*. • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring*.
Comparing	• Using the concept of *greater than* and *less than* in making comparisons, e.g., the number of violations before and after an "obey the school rules" campaign. • Comparing qualitative data, such as primary and intermediate grade rules. • Comparing quantitative data, such as numbers of students who violated various rules. • Comparing data graphically, such as a line chart showing the number of times each grade level violated a school rule.

Comparing (cont.)	• Comparing fractions and ratios using a slope diagram. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data*.
Estimating/Approximating/Rounding Off	• Estimating the number of students who know various school rules, who will agree or disagree with the existing rules. • Estimating the total number of students in the school. • Rounding off numbers to the nearest whole number, e.g., average preference rating for each grade level. • Estimating appropriate height when hanging posters.
Organizing Data	• Tallying votes to determine priorities. • Tallying rules violations on a chart or graph form. • Ordering real numbers on a graph axis. • See also SCIENCE and SOCIAL SCIENCE lists: *Organizing, Processing Data*.
Statistical Analysis	• Assessing predictability of a larger sample (students in the school) based on results from a small sample (one grade per grade level). • Finding and comparing average preference ratings between the grade levels for various rules. • Interpreting graphs: bar graphs, line charts, histograms, slope diagrams. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data*.
Opinion Surveys/Sampling Techniques	• Conducting opinion surveys, defining data collection methods, makeup and size of sample. • Devising methods of obtaining quantitative information about subjective opinions, such as calculating a preference rating for each question on a survey. • Evaluating survey methods, data obtained, size and type of sample. • See also SCIENCE and SOCIAL SCIENCE lists: *Analyzing, Interpreting Data*.
Graphing	• Using graphs to display data; making the graph form--dividing axes into parts, deciding on an appropriate scale.

Graphing (cont.)

- Representing data on graphs.
  - Bar graph--number of students who do not know various school rules.
  - Conversion graph--converting inches to centimeters.
  - Cumulative distribution graph--percentages of lunch periods that have a certain number or fewer rules violations.
  - Histogram--number of recess times with different number of violations.
  - Line chart--comparing preferences of various rules among the grade levels.
  - Q-Q graph--comparing the number of rules violations before and after the distribution of school rules handbooks.
  - Slope diagram--comparing the number of students who disapprove of various rules and the total number of students who responded to each question.
- Obtaining information from graphs.
- See also SCIENCE and SOCIAL SCIENCE lists: *Communicating, Displaying Data.*

Areas of Study

Numeration Systems

- Using the metric system (decimal system) when making measurements on posters and handbooks, when converting centimeters to millimeters, when figuring dollars and cents.
- Using fractions in measuring length (inches, feet).
- See *Computation Using Operations: Fractions/Ratios/Percentages.*

Number Systems and Properties

- See *Computation Using Operations: Addition/Subtraction; Multiplication/Division/ Fractions/Ratios/Percentages.*

Denominate Numbers/Dimensions

- See *Measuring.*

Accuracy/Measurement Error/Estimation/ Approximation

- See *Measuring* and *Estimating/Approximating/Rounding Off.*

Statistics/Random Processes/ Probability

- See *Statistical Analysis.*

Graphing/Functions	• See *Graphing*.
Fraction/Ratio	• See *Computation Using Operations: Fractions/Ratios/Percentages*.
Equivalence/Inequality/Equations	• See *Comparing* and *Computation Using Operations*.

ACTIVITIES IN SCHOOL RULES UTILIZING SCIENCE

Process	
Observing/Describing	• Observing and describing the affects of no school rules, e.g., noisy library, accidents and noise in the hallways. • Observing and describing the physical layout of the school to show where violations occur. • Observing and describing posters that are or are not effective in attracting attention. • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying*.
Classifying	• Determining which parts of the school are noisy and prone to rules violations. • Distinguishing between primary and intermediate students, e.g., posters for primary students vs. posters for intermediate students. • Classifying posters according to size, shape, color. • Classifying colors of letters and backgrounds on posters. • See also MATHEMATICS list: *Classifying/Categorizing*. • See also SOCIAL SCIENCE list: *Observing/Describing/ Classifying*.
Identifying Variables	• Identifying the time of day as a variable in school rules violations. • Identifying colors, lettering size, and layout as variables in attracting attention to posters and handbooks. • See also SOCIAL SCIENCE list: *Identifying Problems, Variables*.
Defining Variables Operationally	• Defining time of day as that measured (or given) by the school clock. • Defining a "high rules violation" period or place as one in which rules were violated 80 or more times. • Defining an acceptable rule to the school students as one that is favored by 80% of the students sampled. • Defining an effective "obey the school rules" campaign as one which the number of rules violations drops 50%. • Defining lettering size as that measured in centimeters by a ruler.

Defining Variables Operationally (cont.)	• Defining layout in terms of geometric figures and placement.
Manipulating, Controlling Variables/ Experimenting	• Conducting trials of observations to determine the best ways to collect data on rules violations. • Observing at different times of the day. • Making posters with different-sized letters and different-colored letters. • See also SOCIAL SCIENCE list: *Manipulating, Controlling Variables/Experimenting.*
Designing and Constructing Measuring Devices and Equipment	• Making posters, handbooks. • Making a chart form on which to tally rules violations.
Inferring/Predicting/Formulating, Testing Hypotheses/Modeling	• Predicting that some rules are obeyed more than others. • Predicting and observing that rules are violated more during lunch periods and the time prior to getting out of school. • Hypothesizing that posters, signs, and handbooks will encourage students to obey the school rules; deciding on the basis of observations that they do. • Hypothesizing that a short list of important rules will be remembered and observed more than an all-inclusive list. • Inferring from the Q-Q graph that their "obey the school rules" campaign was successful. • See also SOCIAL SCIENCE list: *Inferring/Predicting/ Formulating, Testing Hypotheses.*
Measuring/Collecting, Recording Data	• Collecting data on rules violations in the hallways and lunchroom. • Using the clock to note the amount of time spent observing in various parts of the school. • Making measurements when making posters, signs, and handbooks. • See also MATHEMATICS list: *Measuring.* • See also SOCIAL SCIENCE list: *Collecting, Recording Data/Measuring.*
Organizing, Processing Data	• Tallying observations on rules violations. • Listing in descending order areas in school and/or the times during the day in which rules are violated the most.

Organizing, Processing Data (cont.)	• See also MATHEMATICS list: *Organizing Data.* • See also SOCIAL SCIENCE list: *Organizing, Processing Data.*
Analyzing, Interpreting Data	• Determining the best method for observing in the hallways based on experimental trials. • Determining the number of posters and signs needed, based on observations. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing.* • See also SOCIAL SCIENCE list: *Analyzing, Interpreting Data.*
Communicating, Displaying Data	• Making a chart on which to record the accumulative observation data. • Reporting data to the class. • See also MATHEMATICS list: *Graphing.* • See also SOCIAL SCIENCE list: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to New Problems	• Applying observational and data collection skills to other real problems. • Using knowledge acquired from working on School Rules to help solve problems in the classroom. • See also SOCIAL SCIENCE list: *Generalizing/Applying Process to Daily Life.*
Areas of Study	
Measurement	• Measuring and marking posters, signs, and handbooks. • Using a clock to measure time of day. • See also MATHEMATICS list: *Measuring.*

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ACTIVITIES IN SCHOOL RULES UTILIZING SOCIAL SCIENCE

Process	
Observing/Describing/Classifying	• Observing that many students do not know the school rules. • Observing differences in preferences for rules between primary and intermediate students. • Classifying rules according to their relevancy for older or younger students. • Observing behavior differences between primary and intermediate students, between boys and girls. • Observing and describing the various ways rules or laws are made in the classroom, school, city, and state. • See also MATHEMATICS list: *Classifying, Categorizing.* • See also SCIENCE list: *Observing/Describing; Classifying.*
Identifying Problems, Variables	• Identifying problems with the present school rules and the ignorance of students as to what these rules are. • Identifying differences in student opinion of what are good school rules, what rules are important, etc. • Identifying the problem of establishing a set of school rules that would be relevant to both the primary and intermediate students. • See also SCIENCE list: *Identifying Variables.*
Manipulating, Controlling Variables/ Experimenting	• Conducting an opinion survey using a random sample from each grade level. • Observing the effects of different wordings of rules on students. • Comparing the various methods used for encouraging students to obey the school rules. • See also SCIENCE list: *Manipulating, Controlling Variables/Experimenting.*
Inferring/Predicting/Formulating, Testing Hypotheses	• Predicting that the younger students will know the school rules better than the older students. • Hypothesizing that students will obey the school rules more after an "obey the school rules" campaign; deciding on the basis of observations and tallies that they did. • Hypothesizing that rules violations will decrease if there is a student-run organization where students may air grievances.

Inferring/Predicting/Formulating, Testing Hypotheses (cont.)	• See also SCIENCE list: *Inferring/Predicting/Formulating, Testing Hypotheses/Modeling.*
Collecting, Recording Data/Measuring	• Conducting an opinion survey on rules preference. • Tallying number of students disobeying school rules during lunch period. • Using a voting procedure to determine which rules the class will work to change. • Collecting information on approaches to having a rule changed. • See also MATHEMATICS list: *Counting; Measuring.* • See also SCIENCE list: *Measuring/Collecting, Recording Data.*
Organizing, Processing Data	• Ordering tasks that need to be done in terms of priority. • Tallying opinion survey data. • Ordering rules in order of student preference and importance, based on opinion survey results. • Ordering the steps of the process of changing a rule. • See also MATHEMATICS list: *Organizing Data.* • See also SCIENCE list: *Organizing, Processing Data.*
Analyzing, Interpreting Data	• Comparing various suggestions for rule changes or alterations. • Evaluating opinion survey methodology. • Comparing primary and intermediate student responses on the opinion survey. • See also MATHEMATICS list: *Comparing; Statistical Analysis; Opinion Surveys/Sampling Techniques; Graphing.* • See also SCIENCE list: *Analyzing, Interpreting Data.*
Communicating, Displaying Data	• Representing opinion survey data on rules on graphs. • Reporting group activities to the class. • See also MATHEMATICS list: *Graphing.* • See also SCIENCE list: *Communicating, Displaying Data.* • See also LANGUAGE ARTS list.
Generalizing/Applying Process to Daily Life	• Gaining insight into the operation of the school and city; understanding more clearly what students may do to institute change.

Generalizing/Applying Process to Daily Life (cont.)	• Concluding that rules are necessary for smooth and efficient operation of the classroom, school, city, etc. • See also SCIENCE list: *Generalizing/Applying Process to New Problems.*
Attitudes/Values	
Accepting Responsibility for Actions and Results	• Making sure that small group tasks (e.g., conducting survey, obtaining necessary permissions) are done. • Scheduling and administering opinion surveys to other classes. • Scheduling and giving presentations to persons in authority. • Being responsible for actions while outside classroom.
Developing Interest and Involvement in Human Affairs	• Providing a set of school rules that students feel are important so that the school will be safe. • Providing an organization (e.g., grievance committee) where students may air grievances about the school rules. • Instituting changes in the school rules so that the school will be a more pleasant place.
Recognizing the Importance of Individual and Group Contributions to Society	• Recognizing that they can improve conditions in the school and that this will help other students. • Assessing the effects of group action on school rules.
Developing Inquisitiveness, Self-Reliance, and Initiative	• Conducting small and large group sessions with some teacher assistance. • Resolving procedural problems that may arise during the course of activities. • Learning to use different ways to obtain needed information, e.g., letter writing, opinion surveying. • Increasing their knowledge of resources, e.g., school faculty and staff. • Choosing and developing the best way to present plans to the principal, school faculty, and staff.
Recognizing the Values of Cooperation, Group Work, and Division of Labor	• Recognizing the efficiency of small group work in conducting an opinion survey, in gathering information from several different sources, in making posters and handbooks.

Recognizing the Values of Cooperation, Group Work, and Division of Labor (cont.)	• Finding that work proceeds smoothly when everyone cooperates.
Understanding Modes of Inquiry Used in the Sciences, Appreciating Their Power and Precision	• Identifying and defining a problem; being able to distinguish it from related but secondary problems. • Recognizing the importance of obtaining student opinions about the school rules. • Determining the best way to collect opinion data. • Using data and graphs to convince the principal and staff that some change in school rules is needed. • See also MATHEMATICS and SCIENCE lists.
Respecting the Views, Thoughts, and Feelings of Others	• Considering all suggestions from members of a group and from the class and assessing their merit. • Obtaining student and faculty opinions of the school rules by using an opinion survey. • Recognizing that people's opinions vary.
Being Open to New Ideas and Information	• Considering suggestions and ideas from all students, faculty and staff. • Considering other ways of doing various tasks.
Learning the Importance and Influence of Values in Decision Making	• Recognizing that opinion differences reflect value differences. • Recognizing that different groups may have different needs for various school rules.

Areas of Study

Political Science/Government Systems	• Investigating systems of administration and control; deciphering the role of governing body over the body that is governed. • Seeking permission from the principal and school faculty to conduct an opinion survey, to test new rules, etc. • Determining the need for rules and laws in the school, city and state; investigating ways rules and laws are made.
Recent Local History	• Investigating the reasons for some of the school rules and regulations. • Determining student opinions about the school rules.

Social Psychology/Individual and Group Behavior	• Recognizing and using different ways of approaching different groups of people, such as the principal, the school faculty, other students. • Recognizing the need for leadership within small and large groups; recognizing differing capacities of individuals for various roles within groups. • Analyzing the effects of a small group making decisions for a larger group.
Sociology/Social Systems	• Devising a system of working cooperatively in small and large groups. • Investigating problems and suggesting changes that affect not only themselves, but other students in the school. • Recognizing peer groups as social systems, that primary and intermediate students' needs are different. • Recognizing that there are many different social groups and that one person belongs to more than one social group. • Working within established social systems to promote change in the school. • Assessing the effects of group action on changing or publicizing the school rules.

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ACTIVITIES IN SCHOOL RULES UTILIZING LANGUAGE ARTS

Basic Skills

Reading: Literal Comprehension--Decoding Words, Sentences, and Paragraphs	• Decoding words, sentences, and paragraphs when reading rules, school handbooks, and drafts of letters and opinion surveys to students, school faculty, and the principal.
Reading: Critical Reading--Comprehending Meanings, Interpretation	• Obtaining factual information about how rules and laws are formed. • Reading and evaluating drafts of letters, opinion surveys, and reports. • Interpreting school rules and regulations found in a school handbook. • Critically analyzing the wording of their proposed rules.
Oral Language: Speaking	• Offering ideas, suggestions and criticisms during small group work and during class discussions. • Reporting group activities to class; responding to criticisms and comments of activities. • Preparing and giving effective oral presentations of survey questions, methods, findings, and suggested solutions to the principal and/or school staff. • Using the telephone properly and effectively to obtain information or to invite a resource person to speak to the class. • Using rules of grammar in speaking.
Oral Language: Listening	• Listening to group reports and to ideas, suggestions, and criticisms of other students and school personnel. • Following spoken directions. • Conducting interviews of schoolmates.
Oral Language: Memorizing	• Memorizing portions of an oral presentation, some of the rules, etc.
Written Language: Spelling	• Using correct spelling in writing letters, rules, reports, and handbooks.

Written Language: Grammar--Punctuation, Syntax, Usage	• Using rules of grammar in writing.

Written Language:
Composition
	• Writing to communicate effectively:
	  • writing opinion surveys; devising questions to elicit desired information; judging whether a question is relevant and whether its meaning is clear.
	  • preparing written reports and letters using notes, data, and graphs; communicating need for change in the school rules.
	  • preparing booklets, posters, and signs of the school rules.

Study Skills: Outlining/Organizing	• Taking notes when consulting authorities or books about ways laws and rules are made or changed. • Developing an opinion survey; ordering the questions. • Organizing data, ideas, facts for inclusion in a letter or a presentation. • Planning and preparing drafts and final copies of letters and reports.
Study Skills: Using References and Resources	• Using the dictionary for correct spelling and for determining word meanings. • Using the library or consulting authorities to determine ways laws are made or changed. • Using the school handbook of rules. • Talking with the principal, school faculty, and personnel to determine the effectiveness of the school rules. • Using the "How To" Cards on specific skills when needed.
Attitudes/Values	
Appreciating the Value of Expressing Ideas Through Speaking and Writing	• Finding that a written letter, an opinion survey, or a presentation evokes a response from people, e.g., the principal, school faculty and personnel, other students. • Finding that many people can be informed about the school rules through posters, signs, and handbooks.

Appreciating the Value of Written Resources	• Finding that desired information can be found in written resources, e.g., the dictionary, school handbook, library books on way laws are made.
Developing an Interest in Reading and Writing	• Seeking out written resources that will help in solving problems. • Reading with interest articles on ways laws are made, rules that other schools have, etc.
Making Judgments Concerning What is Read	• Deciding which rules in the school handbook are relevant for students. • Evaluating opinion surveys, letters to determine whether they say what they are supposed to say, etc.
Appreciating the Value of Different Forms of Writing, Different Forms of Communication	• Finding that how information can be best conveyed is determined in part by the audience to whom it is directed. • Finding that certain data or information can be best conveyed by writing it down or by preparing graphs or charts. • Finding that certain data or information should be written down so that it can be referred to at a later time. • Finding that an oral presentation may be better in some cases, while a written letter or report may be better in others.